United States
Department of
Agriculture

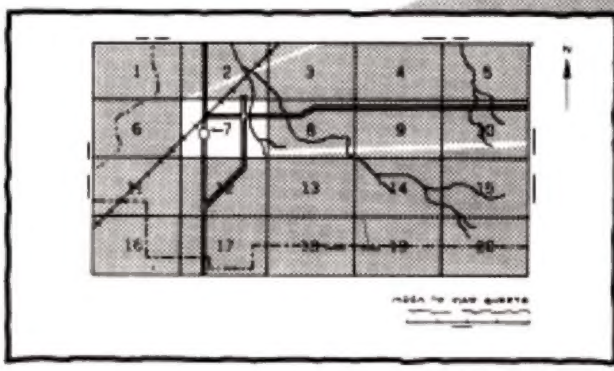
Soil
Conservation
Service

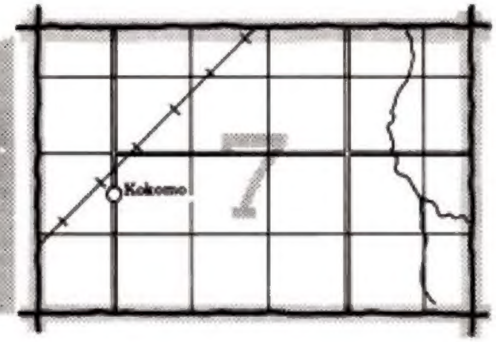
In Cooperation with
Illinois Agricultural
Experiment Station

Soil Survey of Bond County, Illinois

HOW TO USE

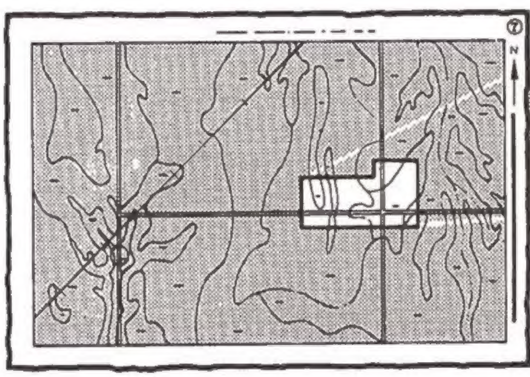
1. Locate your area of interest on the "Index to Map Sheets"

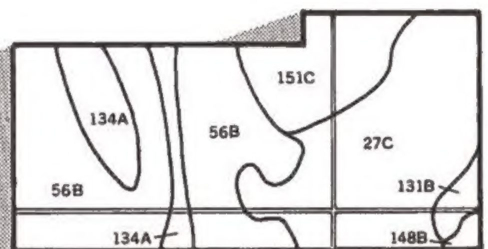




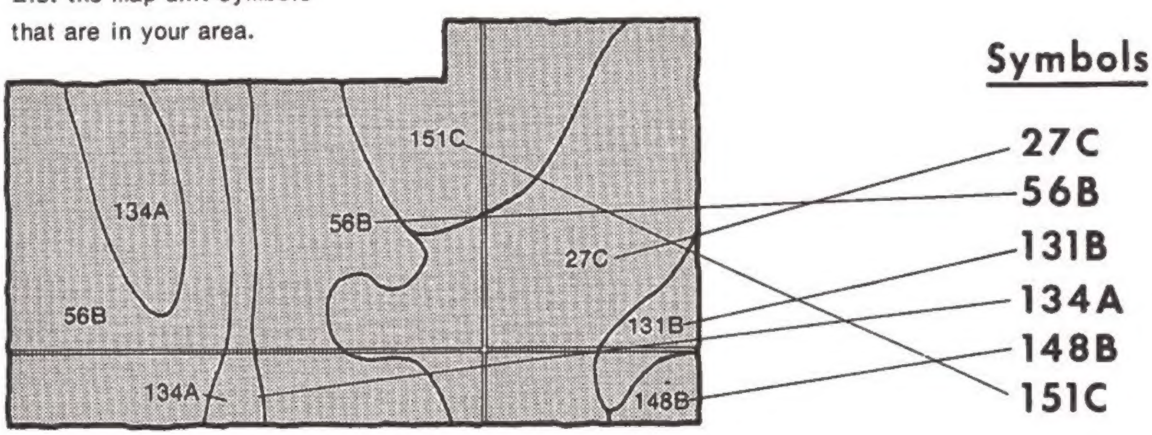
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.



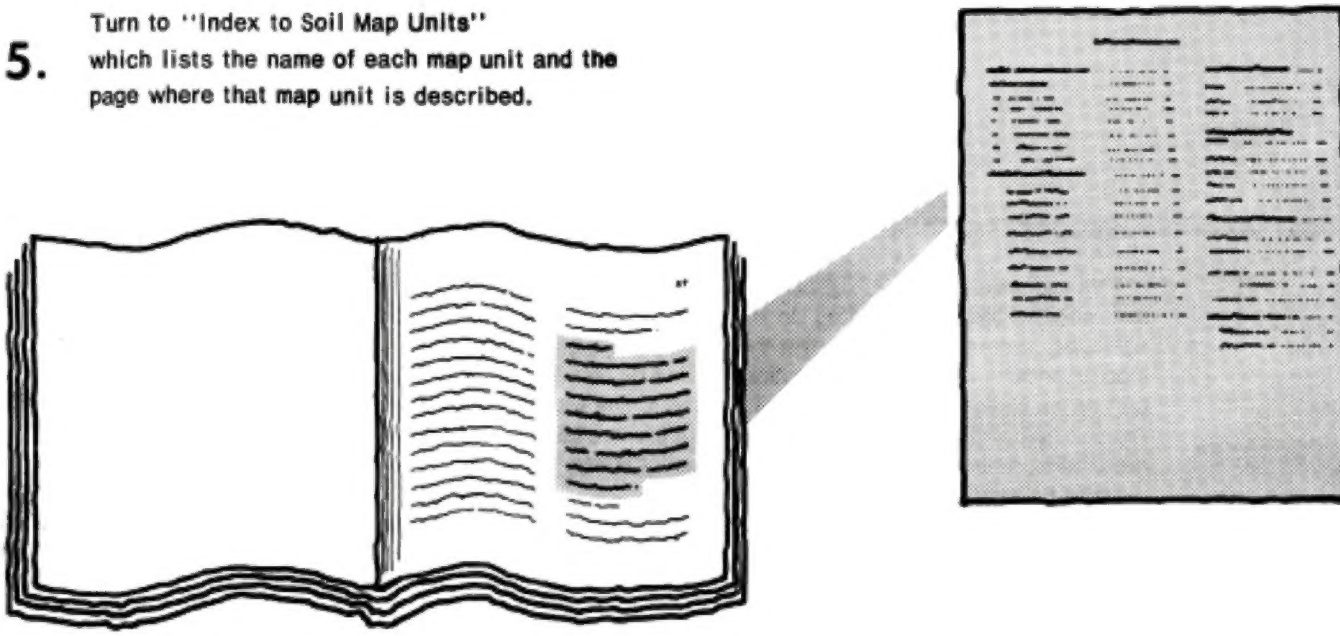


4. List the map unit symbols that are in your area.

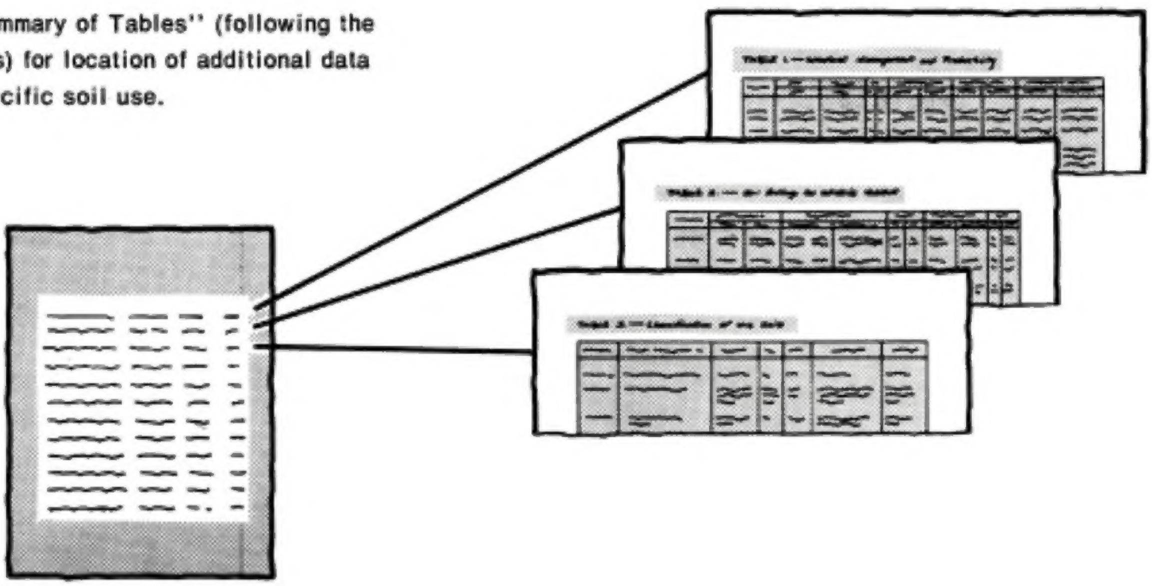


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in 1975-79. Soil names and descriptions were approved in 1981. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1980. This survey was made cooperatively by the Soil Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Bond County Soil and Water Conservation District. The cost of the survey was shared by the Bond County Board of Supervisors.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

This soil survey is Illinois Agricultural Experiment Station Soil Report 116.

Cover: A pastured area along the East Branch of Shoal Creek. The steep Hickory soils are on the side slopes. Birds and Wakeland soils are on the bottom land.

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Soil Series

Issued November 1983

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Summary of Tables

Foreword

This soil survey contains information that can be used in land-planning programs in Bond County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

John J. Eckes
State Conservationist
Soil Conservation Service

Soil Survey of
Bond County, Illinois

By Donald B. Phillips and Tyrone M. Goddard, Soil Conservation Service

Fieldwork by Donald B. Phillips, J. C. Doll, Tyrone M. Goddard, and P. W. Youngstrum, Soil Conservation Service, and Ken Bardo, Steve Donath, Sam Indorante, and Jon Phillips, Bond County Board of Supervisors

United States Department of Agriculture, Soil Conservation Service, in cooperation with the Illinois Agricultural Experiment Station

BOND COUNTY is in southwestern Illinois (fig. 1). It has an area of 245,120 acres, or 383 square miles. In 1977, the population was 14,800. Greenville, the largest town, has a population of 4,631.

This survey updates the soil survey of Bond County published by the University of Illinois in 1913 (*5*). It provides larger maps, which show the soils in greater detail than the survey published in 1913. It also provides more up-to-date soil interpretations.

General Nature of the County

This section gives general information concerning Bond County. It describes the natural resources; physiography, relief, and drainage; settlement; farming; and climate.

Natural Resources

Soil is an important natural resource in Bond County. Other natural resources include sand, gravel, and clay; oil and natural gas; coal; timber; and water.

Sand and gravel deposits are in scattered small areas throughout the county. In 1973, four sand and gravel pits and one clay pit were in operation (*8*). They provided building material for construction.

In 1975, the county produced 39,600 barrels of crude oil from 136 wells in 13 oil fields (*9*). The first oil well was brought into production in 1938. Since then, the county has produced more than 7 million barrels of crude oil and more than 1 billion cubic feet of natural gas.

Most of Bond County is underlain by bituminous coal. Past mining activity produced more than 7.3 million tons of coal, but no mines are currently active in the county. According to a recent estimate, the county has more than 2.7 billion tons of coal reserves (*11*).

More than 35,200 acres in the county is woodland (*6*). This represents about 117 million board feet. The annual cut is 1.3 million board feet, which is below the recommended annual cut of 6.1 million board feet.

Water is supplied by surface drainage into Shoal, Sugar, and Silver Creeks and by the Kaskaskia River watershed. Drinking water is supplied both by reservoirs and by deep and shallow wells. The 770-acre Governor Bond Lake, north of Greenville, and about 550 acres of Carlyle Lake, in the southeast corner of the county, provide drinking water to nearby communities. Valley fill ground water supplies are available along Shoal Creek. Moderate-yielding wells can supply water for small communities or for rural households. Low-yielding wells that are 35 to 150 feet deep supply drinking water for most rural households. The county has virtually no sizable bedrock aquifers. Many farm ponds provide water for livestock.

Physiography, Relief, and Drainage

Most of the soils in the county are on uplands. The uplands are glacial till plains covered by loess. The thickness of loess ranges from more than 6 feet in the southwestern part of the county to less than 3 feet in the northeastern part. Oval and oblong ridges rise as much as 50 feet above the till plains. They generally are oriented in a northeast-southwest direction. They are underlain by Hagarstown drift. In some areas the underlying material is a source of sand and gravel.

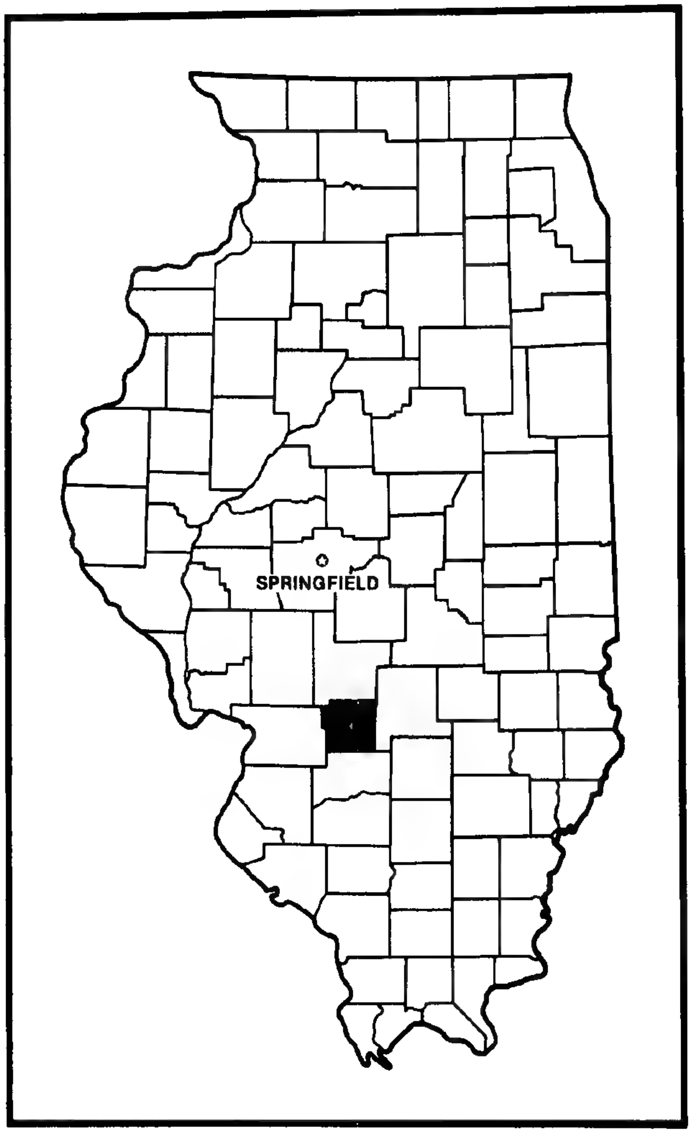

Figure 1.—Location of Bond County in Illinois.

Relief in the county is relatively low. The elevation of most areas on uplands ranges from about 500 feet above sea level in the southern part of the county to more than 650 feet above sea level in the northern part. The elevation of the bottom land and of the flat uplands, called "Dutch Flats," in the southeast corner of the county is 450 to 480 feet above sea level.

The county is dissected by a dendritic stream pattern. Broad ridges are between the drainageways. The county is drained mainly by Shoal Creek and its tributaries. The southwest corner, however, is drained by Sugar and Silver Creeks, and the areas along the eastern edge of the county are drained by the Kaskaskia River. Beaver Creek, a major branch of Shoal Creek, drains the southeastern part of the county. All of the creeks flow south into the Kaskaskia River, which drains into the Mississippi River.

Settlement

When the first settlers arrived in 1806, abundant hardwood forests were in the sloping areas adjacent to streams and drainageways. Prairie grass covered the less sloping, broad plains between the streams. The first settlers pursued an agrarian lifestyle. Small villages and towns were established to provide the services necessary to support the farming community. The population in the area increased, and Bond County was established in 1817. It was one of the original counties in Illinois and was named in honor of Shadrach Bond, the first Governor. Greenville was made the county seat in 1821.

Development of the county was enhanced by the completion of a railroad in 1868. The railroad provided east-west rail service. Pocahontas, Greenville, Smithboro, and Mulberry Grove are along the rail line.

Farming

Since the time of the first settlers, Bond County has been agricultural. The broad plains and rolling hills favor a diversity of agriculture. In 1978, county farmers harvested 81,568 acres of soybeans, 35,083 acres of corn, 19,844 acres of wheat, and 3,438 acres of grain sorghum (*16*). About 11,223 acres was pastured, and 9,716 acres was hayland. The acreage used for grain sorghum produced 285,294 bushels.

Livestock is raised on many of the farms in the county. In 1978, a total of 415 farms raised 15,956 cattle and calves, 297 swine farms raised 56,756 hogs and pigs, and 51 farms raised 30,976 chickens (*16*).

Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Bond County is cold in winter but quite hot in summer. Winter precipitation, which frequently falls during snowstorms, results in a good accumulation of soil moisture by spring and minimizes summer drought on most soils. The normal annual precipitation is adequate for all of the crops suited to the temperature and the length of the growing season in the county.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Hillsboro in the period 1951 to 1973. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 32 degrees F, and the average daily minimum temperature is 23 degrees. The lowest temperature on record, which occurred at Hillsboro on January 28, 1963, is minus 16 degrees. In summer the average temperature is 75

degrees, and the average daily maximum temperature is 87 degrees. The highest recorded temperature, which occurred on July 14, 1954, is 114 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is nearly 39 inches. Of this, 24 inches, or about 60 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 19 inches. The heaviest 1-day rainfall during the period of record was 4.97 inches at Hillsboro on September 17, 1969. Thunderstorms occur on about 45 days each year, and most occur in summer. Tornadoes and severe thunderstorms occur occasionally. They usually are local in extent and of short duration and cause damage in scattered areas.

The average seasonal snowfall is nearly 16 inches. The greatest snow depth at any one time during the period of record was 14 inches. On an average of 3 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 70 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 12 miles per hour, in spring.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biologic activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a

fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows the associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, it consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one association can occur in another unit but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The general soil map of Bond County joins with the general soil map in the soil survey of Montgomery County. In some areas the soil names do not agree across the county line because of different map scales and the resulting variations in the degree of detail or because the same soils were not identified in both counties. The soils and the parent material in these areas are similar, and the soils have similar potentials for uses. In a small area in the northwest corner of the county, upland soils join bottom land soils on the general soil map because of differences in the design of the associations.

Descriptions of Associations

1. Piasa-Cowden association

Nearly level, poorly drained soils that have a very slowly permeable or slowly permeable subsoil and formed in loess; on uplands

This association consists of dark soils on broad till plains in the western part of the county. Slope generally ranges from 0 to 2 percent.

This association makes up about 10 percent of the county. It is about 30 percent Piasa soils, 26 percent Cowden soils, and 44 percent minor soils (fig. 2).

Piasa soils have a very slowly permeable subsoil that is high in content of sodium. Typically, the surface layer is very dark gray silt loam about 8 inches thick. The subsurface layer is grayish brown silt loam about 3 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is dark grayish brown, very firm silty clay loam; the next part is dark gray, mottled, very firm silty clay; and the lower part is gray and light brownish gray, mottled, very firm or firm silty clay loam.

Cowden soils have a slowly permeable, acid subsoil. Typically, the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsurface layer is dark gray and gray silt loam about 8 inches thick. The subsoil is mottled, firm silty clay loam about 39 inches thick. The upper part is dark grayish brown, the next part is grayish brown, and the lower part is gray. The underlying material to a depth of 60 inches is mottled light brownish gray and very dark grayish brown silt loam and black silty clay loam.

Minor in this association are the well drained Douglas soils on prominent, oval or oblong ridges; the somewhat poorly drained Herrick and Oconee soils on gentle slopes and low ridges; and the poorly drained Virden soils on broad flats. The Herrick and Virden soils commonly occur as areas closely intermingled with areas of the Piasa soils.

Most areas of this association are used for cultivated crops. The Piasa soils are moderately suited and the Cowden soils well suited to the crops commonly grown in the county. The main management needs are measures that maintain or improve the drainage system and improve tilth and fertility. The high content of sodium in the subsoil of the Piasa soils restricts the growth of crops.

The major soils generally are poorly suited to dwellings and septic tank absorption fields. A seasonal high water table, a high shrink-swell potential, and the slow or very slow permeability are severe limitations affecting these uses.

2. Oconee-Darmstadt association

Nearly level or gently sloping, somewhat poorly drained soils that have a slowly permeable or very slowly permeable subsoil and formed in loess; on uplands

This association consists of soils on broad ridgetops and on the sides of ridges and drainageways in the western part of the county (fig. 3). Slope generally ranges from 0 to 5 percent.

This association makes up about 16 percent of the county. It is about 49 percent Oconee soils, 40 percent Darmstadt soils, and 11 percent minor soils (fig. 4).

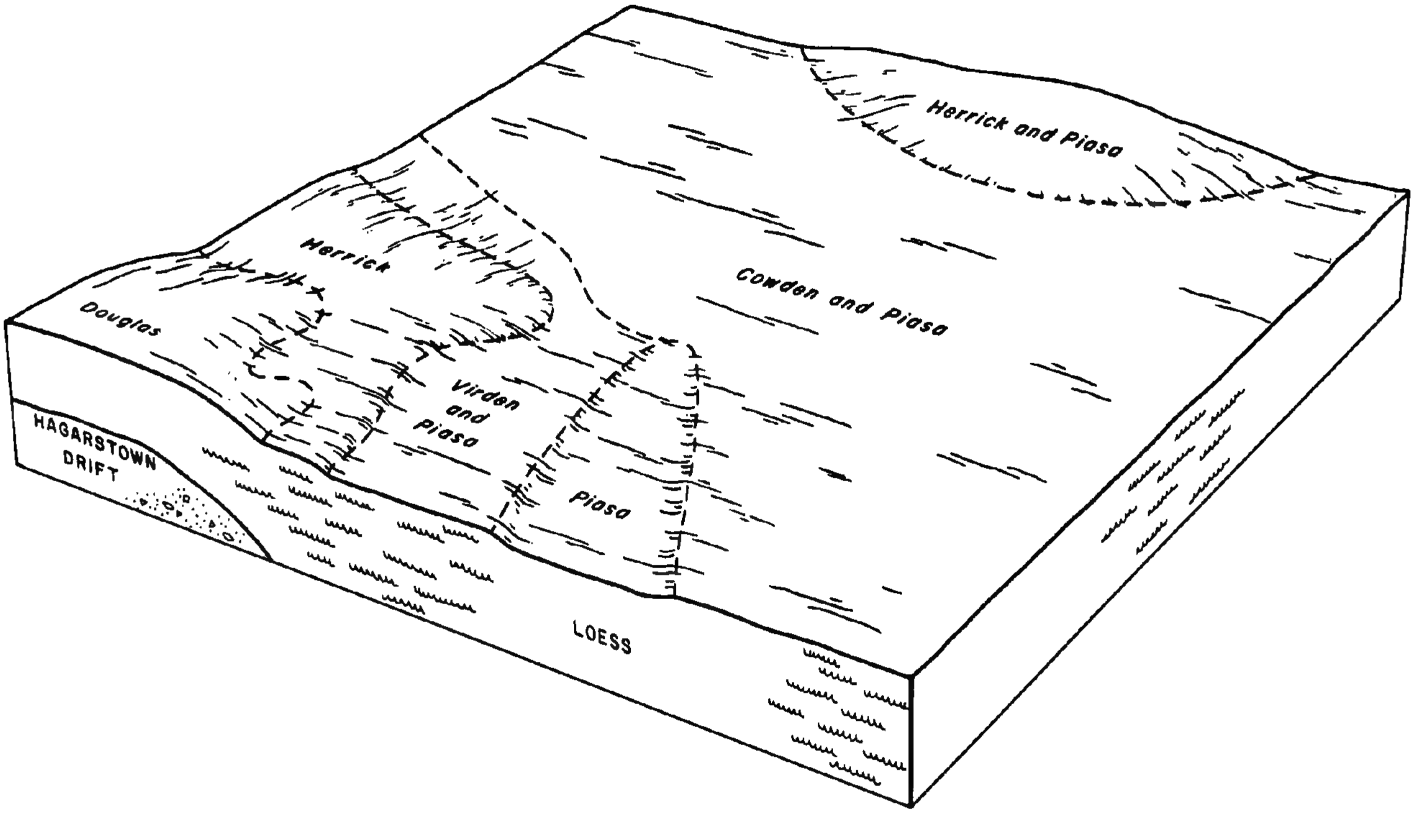

Figure 2.—Pattern of soils in the Piasa-Cowden association.

Oconee soils have a slowly permeable, acid subsoil. Typically, the surface layer is very dark grayish brown silt loam about 9 inches thick. The subsurface layer is grayish brown, mottled silt loam about 5 inches thick. The subsoil is about 40 inches thick. It is firm and mottled. The upper part is yellowish brown silty clay, and the lower part is light brownish gray silty clay loam and silt loam. The underlying material to a depth of 70 inches is pinkish gray, mottled, friable silt loam.

Darmstadt soils have a very slowly permeable subsoil that is high in content of sodium. Typically, the surface layer is brown silt loam about 7 inches thick. The subsurface layer is grayish brown silt loam about 3 inches thick. The subsoil is about 35 inches thick. It is mottled. The upper part is yellowish brown, firm silty clay loam; the next part is light brownish gray and gray, firm and friable silty clay loam; and the lower part is light brownish gray, friable silt loam. The underlying material to a depth of 60 inches is gray, mottled silt loam.

Minor in this association are the well drained Douglas and moderately well drained Tamalco soils on prominent, oval or oblong ridges and the poorly drained Cowden, Huey, Piasa, and Rushville soils in nearly level or slightly depressional areas.

Most areas of this association are used for soybeans, corn, or small grain. The Oconee soils are well suited and the Darmstadt soils moderately suited to the crops commonly grown in the county. The main management needs are measures that maintain or improve the drainage system, control erosion, and maintain tilth and fertility. The high content of sodium in the subsoil of the Darmstadt soils restricts the growth of crops.

The major soils are poorly suited to dwellings and septic tank absorption fields. The wetness and the shrink-swell potential are limitations on sites for dwellings. The slow or very slow permeability and the wetness are limitations in septic tank absorption fields.

3. Hickory-Marine-Hosmer association

Nearly level to steep, well drained to somewhat poorly drained soils that have a moderately permeable, slowly permeable, or very slowly permeable subsoil and formed in glacial till or loess; on uplands

This association consists of nearly level and gently sloping soils on ridges and moderately sloping to steep soils on side slopes along drainageways in the western part of the county (fig. 5). The soils formed under forest vegetation. Slope ranges from 0 to 30 percent.

This association makes up about 18 percent of the county. It is about 26 percent Hickory soils, 23 percent Marine soils, 17 percent Hosmer soils, and 34 percent minor soils (fig. 6).

Figure 3.—Typical landscape in the Oconee-Darmstadt association. The light colored areas are Darmstadt and Huey soils, and the dark areas are Oconee and Cowden soils.

Hickory soils are well drained, are steep, and have a moderately permeable subsoil. They formed in glacial till on side slopes. Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is light yellowish brown, friable silt loam about 8 inches thick. The subsoil is clay loam about 34 inches thick. The upper part is yellowish brown and dark yellowish brown and is firm, and the lower part is yellowish brown and pale brown, is mottled, and is very firm. The underlying material to a depth of 60 inches is light yellowish brown, mottled, firm loam.

Marine soils are somewhat poorly drained, are nearly level or gently sloping, and have a slowly permeable subsoil. They formed in loess on ridges. Typically, the surface layer is brown silt loam about 7 inches thick. The subsurface layer is light gray, mottled silt loam about 9 inches thick. The subsoil to depth of more than 60 inches is very firm or firm, mottled silty clay loam. The upper part is yellowish brown, and the lower part is grayish brown and light brownish gray.

Hosmer soils are moderately well drained and have a subsoil that is moderately permeable in the upper part and very slowly permeable in the lower part. They are gently sloping on ridges and moderately sloping on side slopes. They formed in loess. Typically, the surface layer is dark grayish brown silt loam about 7 inches thick. The subsurface layer is dark brown and brownish yellow silt loam about 10 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, firm silty clay loam; the next part is dark yellowish brown, mottled, firm silty clay loam; and the lower part is dark yellowish brown, mottled, firm and brittle silty clay loam and silt loam.

Minor in this association are the somewhat poorly drained Atlas, Darmstadt, Grantfork, and Stoy soils and the moderately well drained Gosport soils. Atlas, Darmstadt, and Grantfork soils are at the head of drainageways, Gosport soils are on side slopes, and Stoy soils are on narrow ridges. Darmstadt and Grantfork soils have a high content of sodium.

The areas on ridgetops and the moderately sloping areas on side slopes generally have been cleared and are farmed. The steeper side slopes are used for woodland or pasture. This association is suited to woodland. The less sloping areas are well suited or moderately well suited to cultivated crops and pasture. The steep slopes moderately restrict the use of equipment in wooded areas. Erosion is a hazard when grasses and legumes are established in pastured areas. Erosion and wetness are management concerns if the soils are used for cultivated crops. In areas where

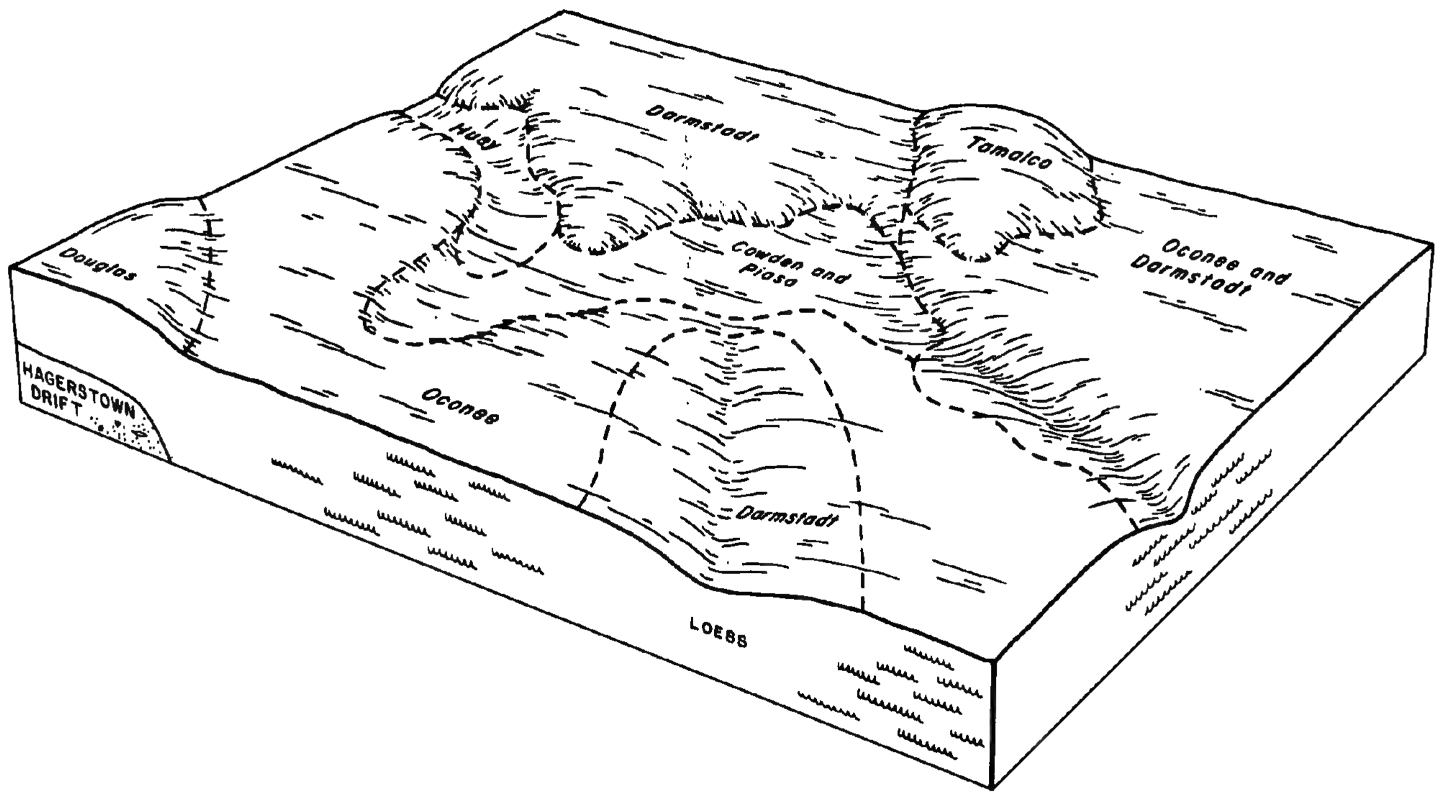

Figure 4.—Pattern of soils in the Oconee-Darmstadt association.

suitable habitat is available, openland and woodland wildlife are abundant.

The major soils are poorly suited to building site development and septic tank absorption fields. The steep slopes, the wetness, a high shrink-swell potential, and the moderate, slow, or very slow permeability are limitations affecting these uses.

4. Wakeland-Lawson association

Nearly level, somewhat poorly drained soils that have a moderately permeable subsoil and formed in silty alluvium; on occasionally flooded bottom land

This association consists of soils on bottom land along the major streams and their tributaries. Slope generally ranges from 0 to 2 percent.

This association makes up about 10 percent of the county. It is about 45 percent Wakeland soils, 28 percent Lawson soils, and 27 percent minor soils (fig. 7).

Wakeland soils are occasionally flooded for brief periods from January through May. Typically, the surface layer is dark grayish brown silt loam about 10 inches thick. The underlying material to a depth of 60 inches is mottled, friable silt loam. The upper part is dark grayish brown, and the lower part is very dark gray.

Lawson soils are occasionally flooded for brief periods from March through June. Typically, the surface soil is very dark grayish brown silt loam about 28 inches thick. The underlying material to a depth of 60 inches is dark grayish brown and mottled grayish brown, dark grayish brown, and dark yellowish brown, friable silt loam.

Minor in this association are the poorly drained Beaucoup and Birds soils in the lower areas on bottom land, the well drained Huntsville soils on natural levees, and the somewhat poorly drained Kendall soils on terraces.

In most areas this association is used for cultivated crops. In some small areas it is used for woodland. It is well suited to cultivated crops, to woodland, and to habitat for openland and woodland wildlife. It generally is unsuited to dwellings and septic tank absorption fields. The wetness and the flooding adversely affect most uses. When flooded, this association furnishes temporary feeding and resting sites for migrating and resident waterfowl.

5. Ava-Hickory-Parke association

Gently sloping to steep, moderately well drained or well drained soils that have a very slowly permeable or moderately permeable subsoil and formed in glacial till or in loess and glacial drift; on uplands

This association consists of steep soils on side slopes along drainageways, gently sloping soils on oval or

Figure 5.—An area of Hosmer and Hickory soils in the Hickory-Marine-Hosmer association. Hosmer soils are on the narrow ridgetops, and the steep Hickory soils are on the side slopes.

oblong glacial ridges, and moderately sloping soils on the long sides of the ridges. The loess is dominantly less than 4 feet thick on the ridgetops. Slope ranges from 1 to 30 percent.

This association makes up about 6 percent of the county. It is about 37 percent Ava soils, 21 percent Hickory soils, 14 percent Parke soils, and 28 percent minor soils (fig. 8).

Ava soils are moderately well drained and have a subsoil that is moderately permeable in the upper part and very slowly permeable in the lower part. They formed in 35 and 45 inches of loess and in the underlying glacial drift. They are gently sloping on narrow ridgetops and moderately sloping on side slopes. Typically, the surface layer is dark brown silt loam about 5 inches thick. The subsurface layer is yellowish brown silt loam about 6 inches thick. The subsoil is about 40 inches thick. The upper part is yellowish brown, firm silt loam and dark yellowish brown, firm silty clay loam; the next part is brown and strong brown, mottled, firm silty clay loam; and the lower part is brown and yellowish brown, mottled, brittle silt loam. The underlying material to a depth of 60 inches is brown, mottled, friable loam.

Hickory soils are well drained, are steep, and have a moderately permeable subsoil. They formed in glacial till on side slopes. Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is light yellowish brown silt loam about 8 inches thick. The subsoil is clay loam about 34 inches thick. The upper part is yellowish brown and dark yellowish brown and is firm, and the lower part is yellowish brown and pale brown, is mottled, and is very firm. The underlying material to a depth of 60 inches is light yellowish brown, mottled, firm loam.

Parke soils are well drained, are moderately sloping, and have a moderately permeable subsoil. They formed in 20 to 40 inches of loess and in the underlying glacial drift. They are on side slopes and ridgetops and are prominently higher on the landscape than the adjacent soils. Typically, the surface layer is dark brown silt loam about 7 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is brown, firm silty clay loam; the next part is reddish brown, firm clay loam; and the lower part is yellowish red, friable clay loam and loam.

Minor in this association are the moderately well drained Hosmer soils on ridges and side slopes, the well drained Pike soils on the crests of ridges, and the well drained, strongly sloping Negley soils on side slopes.

This association is used mainly for cultivated crops or for pasture. The steeper areas are used as woodland or as wildlife habitat. The less sloping soils are moderately

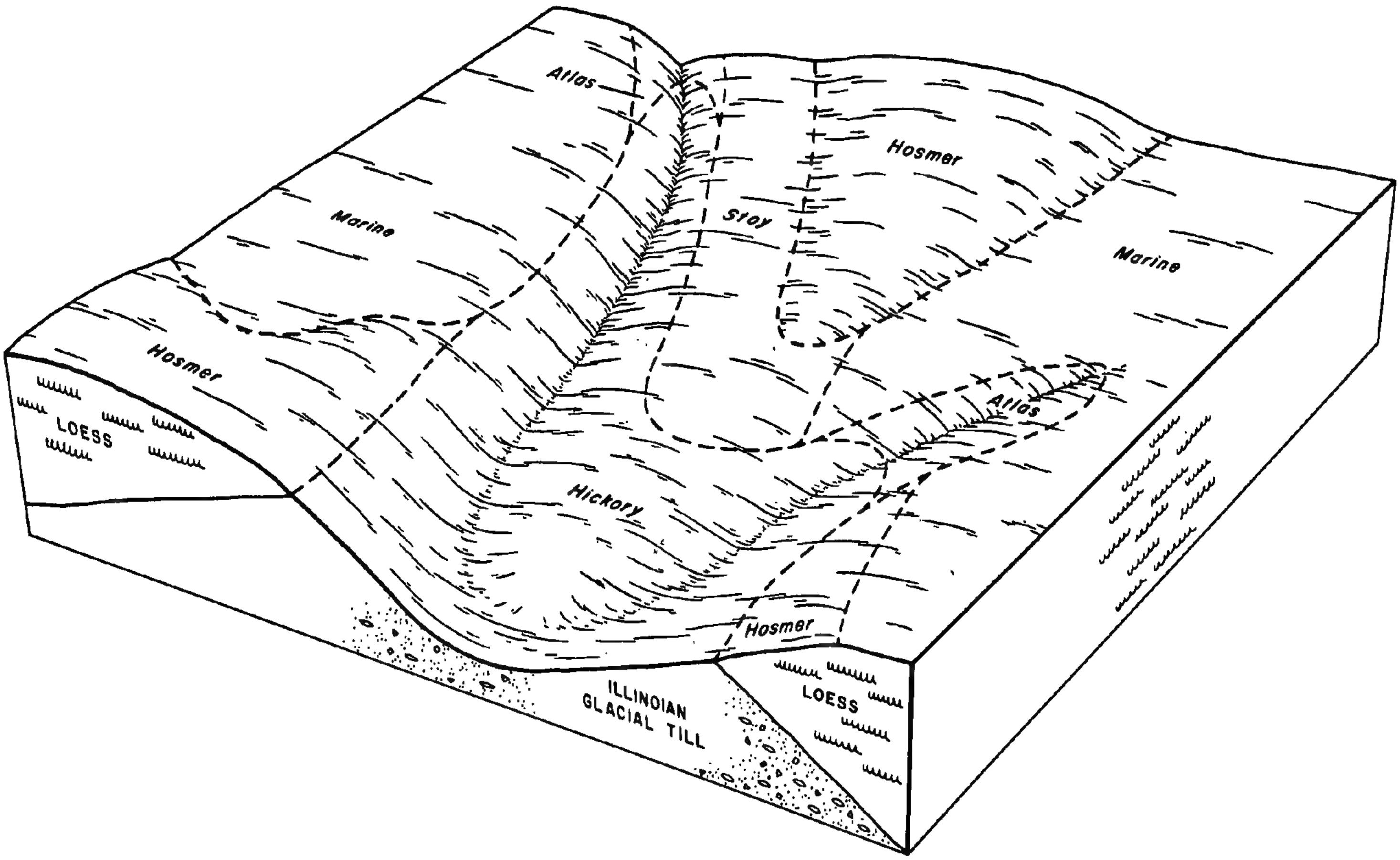

Figure 6.—Pattern of soils in the Hickory-Marine-Hosmer association.

suited to cultivated crops and well suited to pasture. The association is well suited to woodland and to woodland and openland wildlife habitat. Erosion is the major hazard in the cultivated areas. Slope and erosion are concerns in managing the wooded areas.

The major soils generally are moderately suited to dwellings. The slope and the shrink-swell potential are limitations. Also, the wetness of the Ava soils is a limitation on sites for dwellings with basements. In many areas the association is poorly suited to septic tank absorption fields. The very slow permeability of the Ava soils is a limitation. Also, the Hickory soils generally are unsuited to onsite waste disposal because they are steep.

6. Hoyleton-Cisne-Huey association

Nearly level or gently sloping, somewhat poorly drained or poorly drained soils that have a slowly permeable or very slowly permeable subsoil and formed in loess and glacial drift; on uplands

This association consists mainly of soils on the broad, loess-covered till plains in the eastern part of the county. The loess is dominantly less than 4 feet thick. Scattered shallow depressions and low ridges and knolls are throughout the association. Slope generally ranges from 0 to 5 percent.

This association makes up about 29 percent of the county. It is about 32 percent Hoyleton soils, 27 percent Cisne soils, 13 percent Huey soils, and 28 percent minor soils (fig. 9).

Hoyleton soils are somewhat poorly drained, are nearly level or gently sloping, and have a slowly permeable subsoil. Typically, the surface layer is dark brown silt loam about 7 inches thick. The subsoil is about 34 inches thick. It is mottled. The upper part is brown, firm and very firm silty clay loam and silty clay; the next part is yellowish brown and brown, firm silty clay loam; and the lower part is dark brown, firm silt loam that has a high content of sand. The underlying material to a depth of 60 inches is dark brown, firm silt loam.

Cisne soils are poorly drained, are nearly level, and have a very slowly permeable subsoil. Typically, the surface layer is very dark grayish brown silt loam about 7 inches thick. The subsurface layer is grayish brown and light gray, mottled silt loam about 9 inches thick. The subsoil is about 30 inches thick. It is mottled. The upper part is grayish brown, firm silty clay loam; the next part is grayish brown, very firm and firm silty clay; and the lower

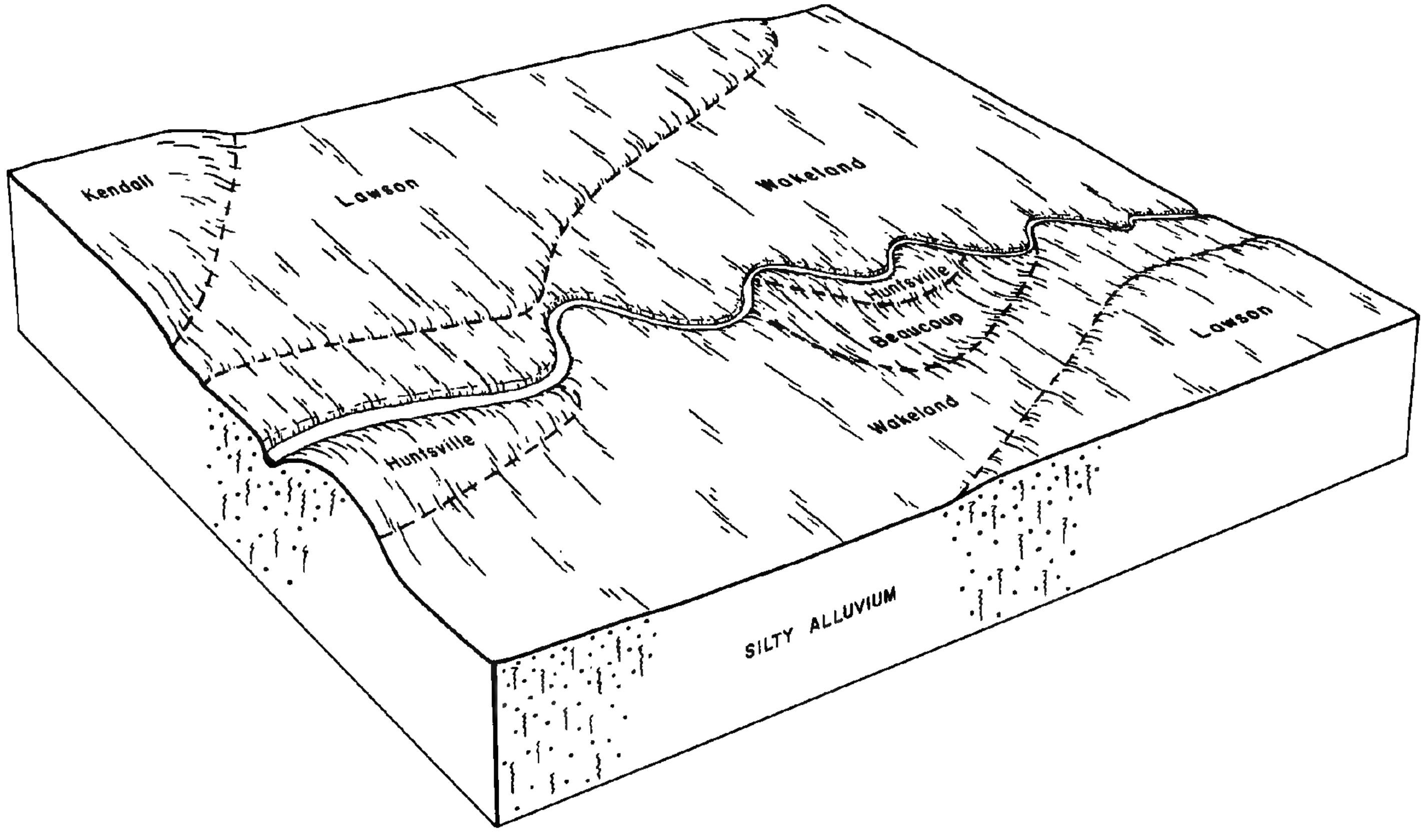

Figure 7.—Pattern of soils in the Wakeland-Lawson association.

part is light brownish gray, firm silty clay loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, firm clay loam.

Huey soils are poorly drained, are nearly level, and have a very slowly permeable subsoil that is high in content of sodium. They commonly occur as areas closely intermingled with areas of the Cisne soils. Typically, the surface layer is dark grayish brown silt loam about 7 inches thick. The subsurface layer is grayish brown silt loam about 6 inches thick. The subsoil is light brownish gray, mottled, firm and very firm silty clay loam about 29 inches thick. The underlying material to a depth of 60 inches is gray, mottled, friable silt loam.

Minor in this association are the somewhat poorly drained Darmstadt soils, which commonly occur as areas closely intermingled with areas of the Hoyleton soils; the poorly drained Ebbert soils in oval depressions; and the moderately well drained Richview and Tamalco soils on ridges and knolls.

Most areas of this association are used for corn, soybeans, and small grain. The Hoyleton and Cisne soils are well suited or moderately well suited to the crops commonly grown in the county. Wetness and erosion are concerns in managing these soils for cultivated crops. The Huey soils are poorly suited to cultivated crops because the high content of sodium results in moisture stress during dry periods and excess moisture during wet periods. Also, the sodium restricts the availability and uptake of some plant nutrients.

The major soils generally are poorly suited to dwellings and septic tank absorption fields. A seasonal high water table and the slow or very slow permeability are limitations affecting these uses. The high content of sodium in the Huey soils also is a limitation.

7. Bluford-Hickory-Atlas association

Nearly level to steep, somewhat poorly drained or well drained soils that have a slowly permeable, moderately permeable, or very slowly permeable subsoil and formed in loess or silty sediments and the underlying glacial till or in glacial till; on uplands

This association consists of soils on ridges and side slopes along drainageways in the eastern part of the county. The soils are nearly level or gently sloping on the ridges and moderately sloping to steep on the side slopes. They formed under forest vegetation. Slope ranges from 0 to 30 percent..

This association makes up about 11 percent of the county. It is about 43 percent Bluford soils, 21 percent Hickory soils, 19 percent Atlas soils, and 17 percent minor soils (fig. 10).

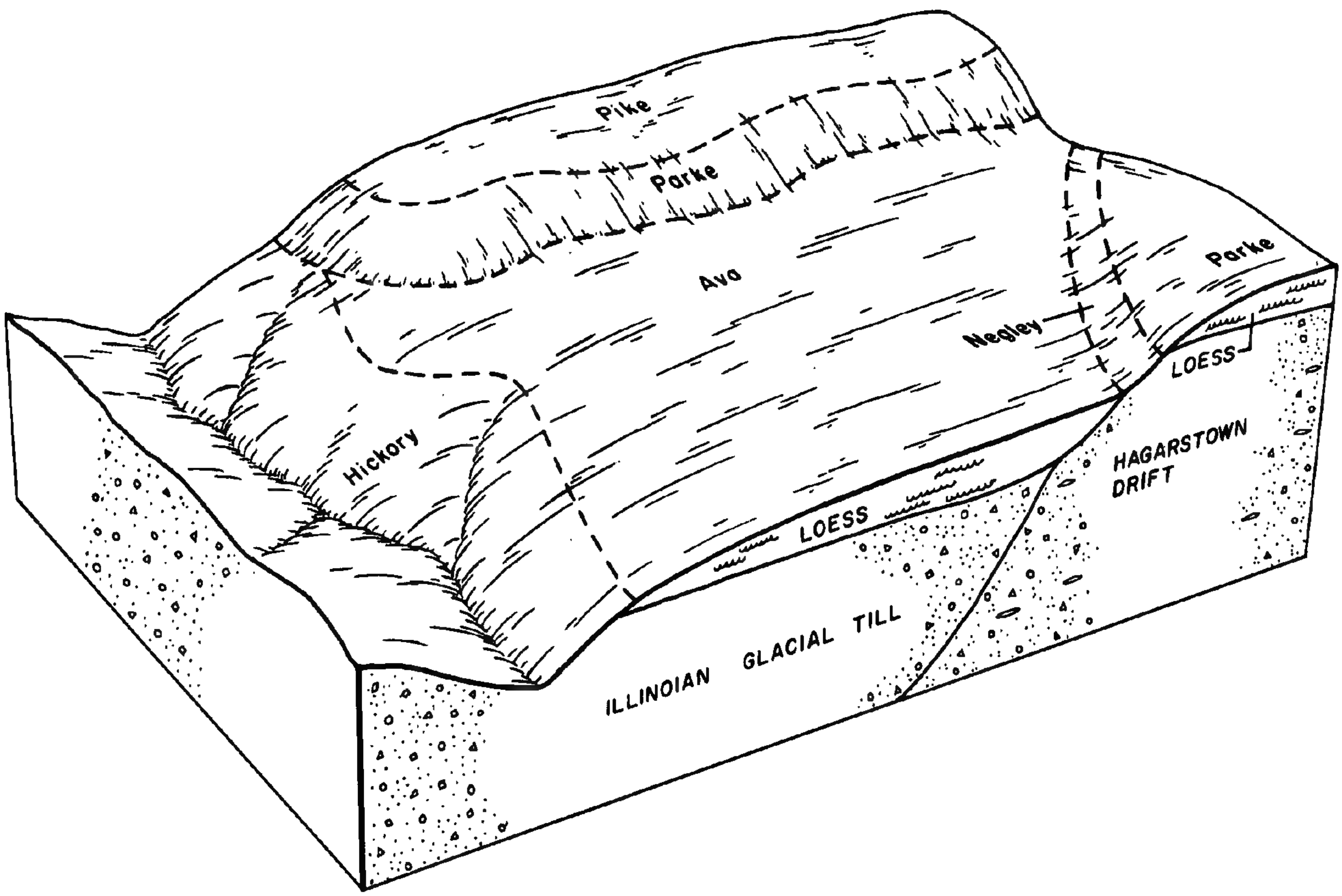

Figure 8.—Pattern of soils in the Ava-Hickory-Parke association.

Bluford soils are somewhat poorly drained and are moderately slowly permeable in the upper part and slowly permeable in the lower part. They formed in 36 to 55 inches of loess and in the underlying glacial till. They are nearly level and gently sloping and are on ridges. Typically, the surface layer is brown silt loam about 8 inches thick. The subsurface layer is pale brown, mottled silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled. The upper part is brown and pale brown, very firm silty clay loam; the next part is light brownish gray, firm silty clay loam and silt loam; and the lower part is light brownish gray and pinkish gray, firm and brittle silt loam.

Hickory soils are well drained, steep, and moderately permeable. They formed in glacial till on side slopes. Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is light yellowish brown, friable silt loam about 8 inches thick. The subsoil is clay loam about 34 inches thick. The upper part is yellowish brown and dark yellowish brown and is firm, and the lower part is yellowish brown and pale brown, is mottled, and is very firm. The underlying material to a depth of 60 inches is light yellowish brown, mottled, firm loam.

Atlas soils are somewhat poorly drained, moderately sloping, and very slowly permeable. They formed in less than 20 inches of silty sediments and in the underlying Illinoian till. They are on side slopes at the head of drainageways. They commonly are severely eroded. Typically, the surface layer is dark brown silty clay loam about 5 inches thick. It is mostly subsoil material. The subsoil extends to a depth of more than 70 inches. It is mottled. The upper part is brown, firm silty clay loam; the

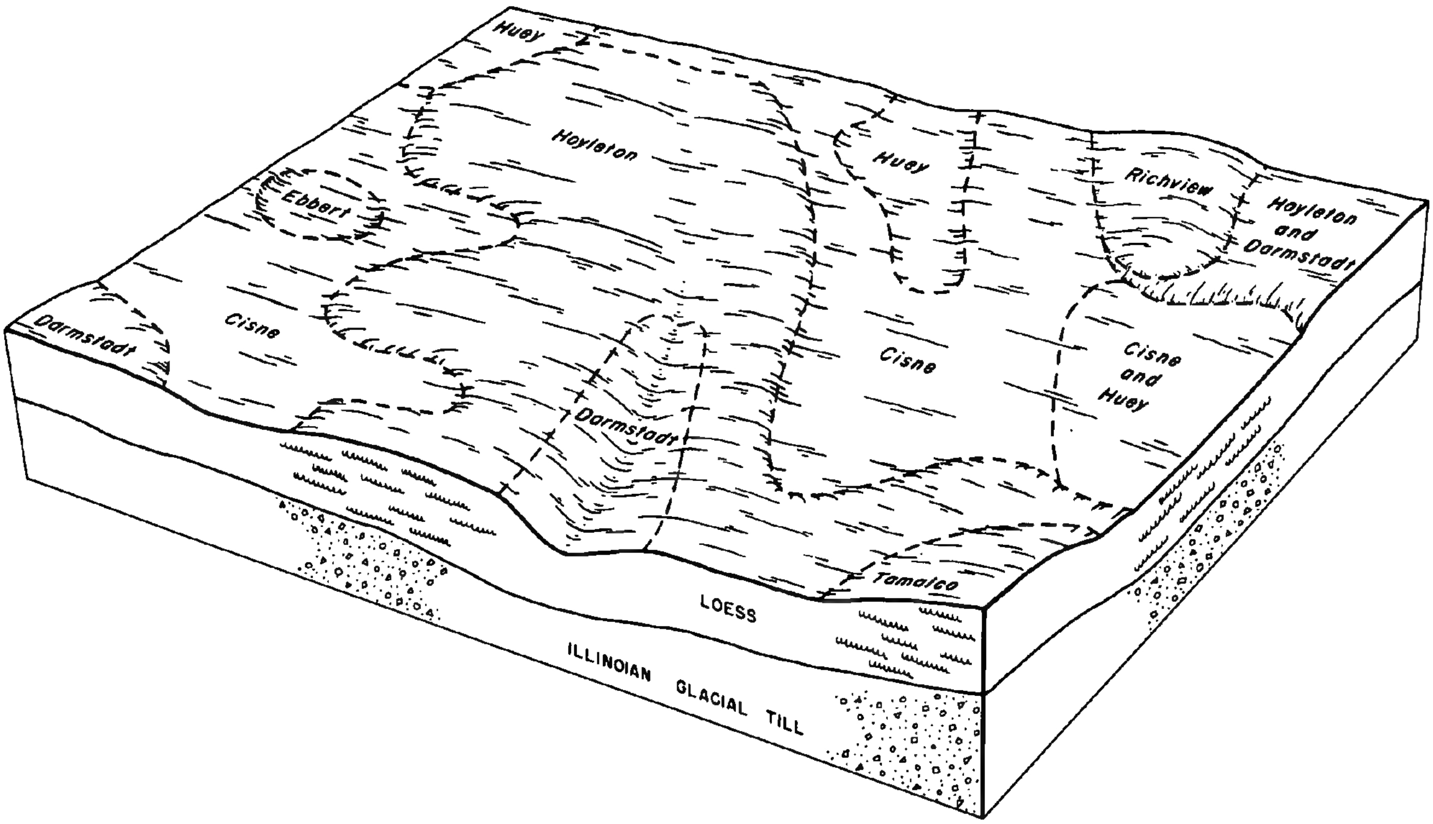

Figure 9.—Pattern of soils in the Hoyleton-Cisne-Huey association.

next part is grayish brown and light brownish gray, very firm clay loam; and the lower part is grayish brown and light brownish gray, firm clay loam.

Minor in this association are the poorly drained, nearly level Wynoose soils on broad ridges, the moderately well drained Ava soils on narrow ridges, and the somewhat poorly drained, nearly level Hoyleton soils on broad ridgetops.

The areas on ridgetops and the moderately sloping areas on side slopes are used mainly for cultivated crops or for pasture. The steeper areas are used for woodland or for wildlife habitat. The less sloping soils are well suited or moderately well suited to cultivated crops and are well suited to pasture. The association is well suited to woodland and to woodland and openland wildlife habitat. Erosion and wetness are concerns in managing the cultivated areas. Slope and erosion are concerns in managing the wooded areas.

This association generally is poorly suited to dwellings and septic tank absorption fields. The wetness, the shrink-swell potential, the moderate, slow, or very slow permeability, and the slope are limitations affecting these uses.

Broad Land Use Considerations

The soils in Bond County are used mainly for cultivated crops or for hay and pasture. Other uses include woodland and urban development. About 62 percent of the acreage is used for soybeans, corn, and wheat and about 16 percent for hay and pasture. About 12 percent is woodland, and only about 4 percent is land in towns, villages, and suburbs or is areas used as sites for industries or highways (*7*). The suitability of the soils for these uses varies significantly.

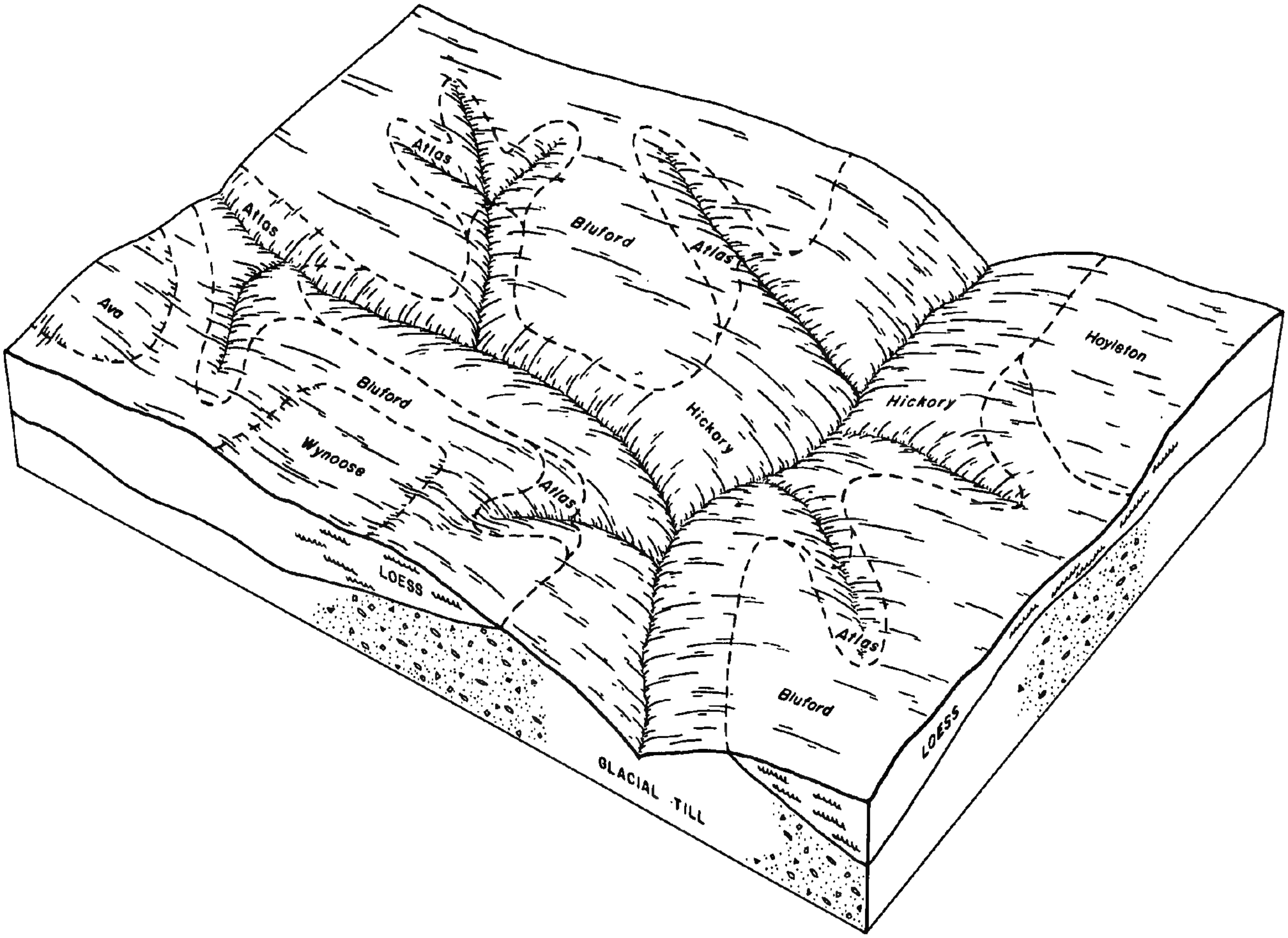

Figure 10.—Pattern of soils in the Bluford-Hickory-Atlas association.

Soybeans, corn, and wheat are grown most extensively in areas of associations 1, 2, 4, and 6. These associations dominantly are moderately suited or well suited to cultivated crops. Wetness is a problem on the major soils that are nearly level or low lying, such as Cisne, Cowden, Piasa, and Wakeland. Also, flooding may damage crops on Wakeland soils. The more sloping soils in these associations, such as Hoyleton, Darmstadt, and Oconee, are very susceptible to erosion. Terraces and a cropping or tillage system that controls erosion are needed on these soils. Darmstadt and Piasa soils have a high content of sodium. The sodium reduces yields and increases the susceptibility to erosion.

Much of the hayland and pasture is in areas of associations 3, 5, and 7. The less sloping major soils in these associations, such as Ava, Bluford, Parke, and Marine, are well suited to hay and pasture. Excessive slope limits the suitability of Hickory soils for hay and pasture.

Most of the woodland is in areas of associations 3, 4, 5, and 7. The Atlas, Ava, Bluford, Marine, and Parke soils in these associations are well suited to woodland. Wakeland soils are only moderately suited because of plant competition. Hickory soils are only moderately suited because of the erosion hazard and the equipment limitation. Important trees in the county include white oak, red oak, shagbark hickory, sugar maple, and ash. Sycamore and silver maple are abundant in areas of association 4.

Dwellings and septic tank absorption fields are in areas of all the associations. Association 4 generally is unsuited to dwellings and septic tank absorption fields because of flooding. Most of the major soils in associations 1, 2, 3, 6, and 7 are poorly suited, mainly because of wetness, the shrink-swell potential, slow or very slow permeability, or slope. Bluford soils are moderately suited to dwellings without basements and poorly suited to septic tank absorption fields. The Ava and Parke soils in association 5 are moderately suited to dwellings. Ava soils are poorly suited to septic tank absorption fields, and Parke soils are well suited.

The suitability for the development of wildlife habitat is good throughout the county. Associations 1, 2, and 6 are well suited to openland wildlife habitat. Associations 3, 5, and 7 are well suited to woodland wildlife habitat. Association 4 is moderately suited to wetland wildlife habitat.

Recreation uses include camp and picnic areas, playgrounds, and paths and trails. Associations 1 and 4 are poorly suited to these uses because of wetness and flooding. Associations 2 and 6 are only moderately suited because of slow permeability and wetness. The Hickory soils in associations 3, 5, and 7 are moderately suited to paths and trails but are poorly suited to the other uses because of excessive slope.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Hoyleton silt loam, 2 to 5 percent slopes, eroded, is one of several phases in the Hoyleton series.

Some map units are made up of two or more major soils. These map units are called soil complexes. A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Hickory-Gosport complex, 15 to 30 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, gravel, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Of the counties adjacent to Bond County, only Montgomery County has been described in a modern soil survey report. In Montgomery County, six soils or complexes join with similar soils that have different names in Bond County. These soils were not included in the soil survey of Bond County because the acreage was insignificant, because the series was inactive, or because conceptual changes resulted from changes in soil classification.

The soils that join at the county line are similar and have similar interpretations. Matching symbols on the detailed maps of the two counties indicate similar map units, but the slope gradients do not exactly match because the slope ranges for the sloping phases are wider in Bond County. Also, a single-line perennial stream symbol is used on the maps of Bond County, whereas a double-line perennial stream symbol is used on the maps of Montgomery County. This difference results from changes in stream classification.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

2—Cisne silt loam. This nearly level, poorly drained soil is on broad till plains. Individual areas are irregular in shape and range from 3 to 200 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 7 inches thick. The subsurface layer is grayish brown and light gray, mottled silt loam about 9 inches thick. The subsoil is about 30 inches thick. It is mottled. The upper part is grayish brown, firm silty clay loam; the next part is grayish brown, very firm and firm silty clay; and the lower part is light brownish gray, firm silty clay loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, firm clay loam. In

some areas the surface layer is lighter in color. In other areas it is thicker. In places the subsoil contains less clay.

Included with this soil in mapping are small, closely intermingled areas of Huey soils. These soils have a high content of sodium in the subsoil. Also included are some areas of the somewhat poorly drained Darmstadt and Hoyleton soils on ridges and knolls. Included soils make up 5 to 20 percent of the unit.

Water and air move through the Cisne soil at a very slow rate. Surface runoff is slow. A perched seasonal high water table is within a depth of 2 feet from February through June in most years. Available water capacity is high. The surface layer typically is neutral because of past liming practices but is strongly acid or medium acid if not limed. The subsoil is medium acid to very strongly acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is high in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings. This soil is moderately suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for soybeans, corn, and small grain. Measures that maintain or improve the drainage system are needed. A combination of scattered subsurface drains and surface inlets reduces the wetness. Soil blowing is a hazard. It can be controlled, however, by leaving crop residue on the surface and by establishing field windbreaks. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the infiltration rate and help to maintain good tilth.

If this soil is used as a site for dwellings, the seasonal wetness and the high shrink-swell potential are limitations. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water also help to overcome the wetness.

The seasonal wetness and the very slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on this soil.

The capability subclass is IIIw.

3A—Hoyleton silt loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on uplands. Individual areas are irregular in shape and range from 3 to 75 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 9 inches thick. The subsurface layer is brown and pale brown silt loam about 10 inches thick. The subsoil to a depth of 60 inches is mottled, firm silty clay loam. The upper part is yellowish brown, and the lower part is light brownish gray and has a high content of sand. In some areas the surface soil and subsoil have a very low content of sand. In other areas the surface soil is thicker and is darker in the lower part. In some places the subsoil contains less clay. In other places it has a higher proportion of gray colors.

Included with this soil in mapping are small, closely intermingled areas of Darmstadt soils. These soils have a high content of sodium in the subsoil. Also included are some areas of the poorly drained Cisne and Huey soils on the lower flats. Included soils make up 15 to 25 percent of the unit.

Water and air move through the Hoyleton soil at a slow rate. Surface runoff is slow. A seasonal high water table is at a depth of 1 to 3 feet from March through June in most years. Available water capacity is high. The surface layer typically is neutral because of past liming practices but is very strongly acid to medium acid if not limed. The subsoil is strongly acid or very strongly acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is high in the subsoil.

Most areas are used for soybeans, wheat, and corn. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

In the areas used for corn, soybeans, or small grain, the wetness delays planting in some years. It can be reduced, however, by a combination of scattered subsurface drains and surface inlets. Unless the surface is protected, erosion is a hazard in some areas. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration. Returning crop residue to the soil and regularly adding other organic material increase the infiltration rate and improve tilth.

If this soil is used as a site for dwellings, the seasonal wetness and the high shrink-swell potential are limitations. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on this soil.

The capability subclass is IIw.

3B—Hoyleton silt loam, 2 to 5 percent slopes. This gently sloping, somewhat poorly drained soil is on ridges in the uplands. Individual areas are irregular in shape and range from 5 to 100 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsurface layer is brown silt loam about 6 inches thick. The subsoil is about 41 inches thick. It is mottled. The upper part is yellowish brown, firm silty clay loam; the next part is brown, firm silty clay loam; and the lower part is light brownish gray, friable silt loam high in content of sand. The underlying material to a depth of 60 inches is grayish brown, friable silt loam. In some areas the subsoil contains less clay. In other areas the surface layer is lighter in color. In some eroded areas it has been mixed with the upper part of the subsoil through cultivation.

Included with this soil in mapping are small areas of the poorly drained Cisne and Huey soils on the lower flats. Also included are closely intermingled areas of Darmstadt soils, which have a high content of sodium in the subsoil. Included soils make up 5 to 20 percent of the unit.

Water and air move through the Hoyleton soil at a slow rate. Surface runoff is medium. A seasonal high water table is at a depth of 1 to 3 feet from March through June in most years. Available water capacity is high. The surface layer typically is neutral because of past liming practices. If not limed, however, it is very strongly acid to medium acid. The subsoil is strongly acid or very strongly acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is high in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

In the areas used for corn, soybeans, or small grain, erosion is a hazard unless the surface is protected. Also, the wetness delays planting in some years. It can be reduced, however, by a combination of scattered subsurface drains and surface inlets. Erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, by contour farming, or by terraces. Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration. Returning crop residue to the soil and regularly adding other organic material increase the infiltration rate and improve tilth.

If this soil is used as a site for dwellings, the seasonal wetness and the high shrink-swell potential are limitations. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIe.

3B2—Hoyleton silt loam, 2 to 5 percent slopes, eroded. This gently sloping, somewhat poorly drained soil is on the sides of ridges and along drainageways in the uplands. Individual areas are irregular in shape and range from 3 to 60 acres in size.

Typically, the surface layer is dark brown silt loam about 7 inches thick. The subsoil is about 34 inches thick. It is mottled. The upper part is brown, firm and very firm silty clay loam and silty clay; the next part is yellowish brown and brown, firm silty clay loam; and the lower part is dark brown, firm silt loam high in content of sand. The underlying material to a depth of 60 inches is dark brown, firm silt loam. In some severely eroded areas, the surface layer is silty clay loam. In some places the subsoil contains less clay. In other places it is clay loam or loam throughout.

Included with this soil in mapping are small, closely intermingled areas of Darmstadt soils and small areas of Grantfork soils on side slopes along drainageways. These soils have a high content of sodium in the subsoil. They make up 5 to 20 percent of the unit.

Water and air move through the Hoyleton soil at a slow rate. Surface runoff is medium. A seasonal high water table is at a depth of 1 to 3 feet from March through June in most years. Available water capacity is high. The surface layer and the upper part of the subsoil typically are neutral because of past liming practices. If not limed, however, the surface layer is very strongly acid to medium acid. The middle and lower parts of the subsoil are very strongly acid. Organic matter content is low. The surface layer is friable and can be easily tilled when moist. It tends to crust and puddle after hard rains, however, because it generally contains subsoil material. Small water channels and seepy spots are common. In the spring the soil dries out more slowly than the soils in surrounding areas. The shrink-swell potential is high in the subsoil.

Most areas are used for soybeans, corn, small grain, pasture, and hay. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops and well suited to pasture and hay. It is poorly suited to dwellings and septic tank absorption fields.

In the areas used for corn, soybeans, or small grain, further erosion is a hazard unless the surface is protected. Also, the wetness delays planting in some years. A drainage system is needed in some areas. Erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after

planting and by contour farming or terraces. Tilling when the soil is wet causes surface compaction, cloddiness, and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, and applications of fertilizer help to keep the pasture and the soil in good condition.

If this soil is used as a site for dwellings, the seasonal wetness and the high shrink-swell potential are limitations. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIe.

4B—Richview silt loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is on convex ridgetops and the crests of loess-covered morainal hills in the uplands. Individual areas are round or oval and range from 2 to 20 acres in size.

Typically, the surface layer is dark brown silt loam about 8 inches thick. The subsurface layer is brown silt loam about 5 inches thick. The subsoil is about 41 inches thick. The upper part is dark yellowish brown, mottled silty clay loam, and the lower part is yellowish brown, mottled silt loam. The underlying material to a depth of 60 inches is brown and dark brown, firm loam. In some areas the surface layer is lighter in color. In other areas it is thicker. In places the lower part of the subsoil contains less sand.

Included with this soil in mapping are small areas of the somewhat poorly drained, slowly permeable Hoyleton soils on the lower ridges. These soils make up less than 10 percent of the unit.

Water and air move through the Richview soil at a moderate rate. Surface runoff is medium in cultivated areas. A seasonal high water table is at a depth of 3.5 to 6.0 feet from February through May in most years. Available water capacity is high. Reaction in the surface layer commonly is slightly acid but varies because of local liming practices. The subsoil is strongly acid or medium acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is moderately suited to dwellings and poorly suited to septic tank absorption fields.

In the areas used for corn, soybeans, or small grain, erosion is a hazard unless the surface is protected. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces. Tilling when the soil is wet causes surface compaction, decreases the rate of water infiltration, and causes excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

The shrink-swell potential is a limitation if this soil is used as a site for dwellings. Also, the seasonal wetness is a limitation on sites for dwellings with basements. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the foundations lowers the water table.

The seasonal wetness is a limitation if this soil is used as a septic tank absorption field. The absorption field functions satisfactorily only if the water table is maintained at a depth of more than 6 feet. Tile drains lower the water table.

The capability subclass is IIe.

4C2—Richview silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on the sides of upland ridges. Individual areas are oval or oblong and range from 2 to 30 acres in size.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, firm silty clay loam, and the lower part is dark brown, friable loam. In some areas the surface layer is lighter in color. In other areas the subsoil is clay loam or loam throughout. In some places the surface layer is silty clay loam because it has been mixed with part of the subsoil through cultivation. In other places the lower part of the subsoil contains less sand.

Included with this soil in mapping are small areas of the somewhat poorly drained, slowly permeable Hoyleton soils and the somewhat poorly drained, very slowly permeable Darmstadt soils. These soils are on the lower side slopes. Also included are some areas of the very slowly permeable Tamalco soils on side slopes. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Richview soil at a moderate rate. Surface runoff is medium. A seasonal high water table is at a depth of 3.5 to 6.0 feet from February through May in most years. Available water capacity is high. Reaction in the surface layer commonly is slighty acid but varies because of local liming practices. The subsoil is medium acid to very strongly acid. Organic matter content is low. The surface layer is friable and can be easily tilled when moist. It tends to

crust and puddle, however, after hard rains, especially in areas where it contains subsoil material. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops and well suited to pasture and hay. It is moderately suited to dwellings and poorly suited to septic tank absorption fields.

In the areas used for corn, soybeans, or small grain, further erosion is a hazard unless the surface is protected. Erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or a crop rotation that includes 1 or more years of forage crops. Tilling when the soil is wet causes cloddiness, surface compaction, and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

The shrink-swell potential is a limitation if this soil is used as a site for dwellings. Also, the wetness is a limitation on sites for dwellings with basements. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Subsurface drains around the foundations lower the water table. The slope is a limitation in some of the steeper areas. Establishing benches by cutting and filling helps to overcome the slope. Compacting the fill improves stability. Extending footings in the fill areas into the undisturbed soil helps to prevent structural damage. Diverting the runoff from the higher areas also helps to prevent this damage.

The seasonal wetness and the slope are limitations if this soil is used as a septic tank absorption field. The absorption field functions satisfactorily only if the water table is maintained at a depth of more than 6 feet and the distribution lines are installed on the contour. Tile drains lower the water table.

The capability subclass is IIe.

7C3—Atlas silty clay loam, 5 to 10 percent slopes, severely eroded. This moderately sloping, somewhat poorly drained soil is on side slopes in the uplands. Individual areas are irregular in shape and range from 3 to 40 acres in size.

Typically, the surface layer is dark brown silty clay loam about 5 inches thick. It is mostly subsoil material. The subsoil extends to a depth of more than 70 inches. It is mottled. The upper part is brown, firm silty clay loam; the next part is grayish brown and light brownish gray, very firm clay loam; and the lower part is grayish brown and light brownish gray, firm clay loam. In some areas the subsoil contains less clay. In other areas it contains less sand.

Included with this soil in mapping are small areas of Grantfork soils on side slopes. These soils have a high content of sodium. Also included are some areas of the well drained Hickory soils on side slopes and the moderately well drained Hosmer soils on ridges. Included soils make up 15 to 25 percent of the unit.

Water and air move through the Atlas soil at a very slow rate. Surface runoff is rapid. A perched seasonal high water table is within a depth of 2 feet from April through June in most years. Available water capacity is moderate. The surface layer typically is neutral because of past liming practices but is very strongly acid to medium acid if not limed. The subsoil is strongly acid to neutral. Organic matter content is low. The surface layer is firm and sticky when wet and hard and cloddy when dry. The soil cannot be tilled so easily as the less eroded adjacent soils. Also, it is seepy in many spots and dries more slowly in the spring than the adjacent soils. It tends to be droughty late in the growing season. The shrink-swell potential is high in the subsoil.

Most areas are used for cultivated crops or for hay and pasture. This soil is poorly suited to cultivated crops because it is highly susceptible to further erosion. It is well suited to pasture and hay and moderately suited to woodland. It is poorly suited to dwellings and septic tank absorption fields.

Measures that control erosion are needed in the areas for soybeans, corn, or small grain. Examples are a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, and a crop rotation that includes 1 or more years of forage crops. Tilling when the soil is wet causes surface compaction, decreases the rate of water infiltration, and causes excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the infiltration rate and improve tilth.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

If this soil is used as woodland, erosion control is needed, especially during periods when seedlings are established. Critical area treatment helps to establish a plant cover on the site before the trees are planted. Harvesting methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Seedlings survive and grow well if competing vegetation is controlled and an adequate fertility level is maintained. Measures that prevent fires and keep out grazing animals help to control erosion and promote tree growth. Timely pruning, thinning, and intermediate cutting improve the woodland.

The seasonal wetness and the high shrink-swell potential are limitations if this soil is used as a site for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Diverting the runoff from upslope areas also reduces the wetness.

The seasonal wetness and the very slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IVe.

8F—Hickory silt loam, 15 to 30 percent slopes. This steep, well drained soil is on dissected uplands along drainageways. Individual areas are long and narrow or irregular in shape and range from 5 to 130 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is light yellowish brown, friable silt loam about 8 inches thick. The subsoil is clay loam about 34 inches thick. The upper part is yellowish brown and dark yellowish brown and is firm, and the lower part is yellowish brown and pale brown, is mottled, and is very firm. The underlying material to a depth of 60 inches is light yellowish brown, mottled, firm loam. In some areas the surface layer and subsoil contain more sand and gravel. In other areas the slope is more than 30 percent or less than 15 percent. In some places the subsoil contains free carbonates. In other places it formed in shale residuum. In some eroded areas the surface layer is silty clay loam.

Included with this soil in mapping are small areas of the somewhat poorly drained Wakeland soils on bottom land. These soils make up less than 10 percent of the unit.

Water and air move through the Hickory soil at a moderate rate. Surface runoff is rapid. Available water capacity is high. The surface layer commonly is very strongly acid. The subsoil is strongly acid or very strongly acid. Organic matter content is moderately low. The shrink-swell potential is moderate in the subsoil.

Most areas are used as woodland (fig. 11). Some are used as pasture. This soil is very well suited to woodland and poorly suited to pasture. It generally is unsuited to dwellings and septic tank absorption fields because of the slope.

Erosion control is needed when grasses and legumes are established in the pastured areas. A permanent cover of pasture plants helps to control erosion and maintain tilth. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

Erosion control is needed when trees are planted or harvested in the wooded areas. The steep slope moderately restricts the use of equipment. Seedlings survive and grow well if competing vegetation is controlled. A protective plant cover and measures that prevent fires and keep out grazing animals help to control erosion and promote tree growth. Timely pruning, thinning, and intermediate cutting improve the woodland.

The capability subclass is VIe.

12—Wynoose silt loam. This level or slightly depressional, poorly drained soil is on broad, loess-covered till plains. Individual areas are irregularly shaped or oval and range from 5 to 60 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 8 inches thick. The subsurface layer is light brownish gray and light gray, mottled silt loam about 14 inches thick. The subsoil is mottled silty clay loam about 27 inches thick. The upper part is gray and is firm and very firm, and the lower part is light brownish gray and is firm and friable. The underlying material to a depth of 60 inches is dark gray, mottled loam. In some areas the surface layer is darker. In other areas the subsoil contains less clay. In places the lower part of the subsoil and the underlying material contain less sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Bluford soils on broad ridges and knolls and the moderately well drained Ava soils on convex ridgetops. These soils make up less than 15 percent of the unit.

Water and air move through the Wynoose soil at a very slow rate. Surface runoff is slow. A seasonal high water table is within a depth of 2 feet from March through June in most years. Available water capacity is high. Reaction in the surface layer commonly is very strongly acid but varies because of local liming practices. The subsoil is very strongly acid or extremely acid. Organic matter content is low. The surface layer is friable and can be easily tilled when moist. It tends to crust or puddle, however, after hard rains. The shrink-swell potential is high in the subsoil.

Most areas are used for cultivated crops. Some small areas are used as woodland. This soil is moderately suited to cultivated crops and poorly suited to woodland. It is poorly suited to dwellings and septic tank absorption fields.

A drainage system is needed in the areas used for corn, soybeans, or small grain. One has been installed in most areas. Scattered surface drains and surface inlets, land leveling, and a combination of shallow ditches and drainage outlets reduce the wetness. Tilling when the soil is wet causes surface compaction and decreases the infiltration rate. Minimizing tillage and returning crop residue to the soil increase the rate of water infiltration and help to maintain good tilth.

In the wooded areas the seasonal wetness results in moderate seedling mortality and severe plant

Figure 11.—A wooded area of Hickory silt loam, 15 to 30 percent slopes.

competition and limits the use of mechanical equipment. The trees that can withstand the wet periods should be selected for planting. Replanting and weeding during the early growth period help to keep the stand fully stocked and control weeds and brush. Harvesting methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Measures that keep out grazing animals and prevent fires are needed. Timely pruning and thinning improve the woodland.

The seasonal wetness and the high shrink-swell potential are limitations if this soil is used as a site for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water also help to overcome the wetness.

The seasonal wetness and the very slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection

tank or an evapotranspiration bed are installed. Sewage lagoons function very well on this soil.

The capability subclass is IIIw.

13A—Bluford silt loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on broad flats and ridges in the uplands. Individual areas are irregular in shape and range from 5 to 90 acres in size.

Typically, the surface layer is brown silt loam about 8 inches thick. The subsurface layer is pale brown, mottled silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled. The upper part is brown and pale brown, very firm silty clay loam; the next part is light brownish gray, firm silty clay loam; and the lower part is light brownish gray and pinkish gray, firm and brittle silt loam. In some areas the lower part of the subsoil contains less sand. In other areas, the surface soil is thicker and the subsoil contains less clay.

Included with this soil in mapping are small areas of the moderately well drained Ava soils on the higher ridges and knolls. These soils contain less clay in the subsoil than the Bluford soil. Also included are small areas of the poorly drained Wynoose soils on flats and in depressions. Included soils make up 15 to 25 percent of the unit.

Water and air move through the upper part of the Bluford soil at a moderately slow rate and through the lower part at a slow rate. Surface runoff is slow. A seasonal high water table is at a depth of 1 to 3 feet from March through June in most years. Available water capacity is high. The surface layer typically is neutral because of past liming practices but is very strongly acid or strongly acid if not limed. The subsoil is slightly acid to extremely acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist. It tends to crust and puddle, however, after hard rains. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

In the areas used for soybeans, corn, or small grain, the wetness delays planting in most years. A combination of scattered subsurface drains and surface inlets improves drainage. Erosion is a hazard in some areas. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface compaction, reduces the rate of water infiltration, and causes excessive runoff. Returning crop residue to the soil and regularly adding other organic material increase the infiltration rate and improve tilth.

The seasonal wetness and the moderate shrink-swell potential are limitations if this soil is used as a site for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evaportranspiration bed are installed. Sewage lagoons function very well on this soil.

The capability subclass is IIw.

13B—Bluford silt loam, 2 to 5 percent slopes. This gently sloping, somewhat poorly drained soil is on broad ridges in the uplands. Individual areas are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 7 inches thick. The subsurface layer is light gray silt loam about 5 inches thick. The subsoil to a depth of more than 60 inches is mottled silty clay loam. The upper part is pale brown and firm, and the lower part is light brownish gray and firm or brittle. In some areas the lower part of the subsoil contains less sand. In other areas the surface layer is firm silty clay loam because it has been mixed with the upper part of the subsoil through cultivation.

Included with this soil in mapping are small areas of the moderately well drained Ava soils on the higher ridges and knolls. These soils contain less clay in the subsoil than the Bluford soil. Also included are small areas of the poorly drained Wynoose soils in depressions. Included soils make up 5 to 25 percent of the unit.

Water and air move through the upper part of the Bluford soil at a moderately slow rate and through the lower part at a slow rate. Surface runoff is medium. A seasonal high water table is at a depth of 1 to 3 feet from March through June in most years. Available water capacity is high. The surface layer commonly is medium acid but is neutral if limed. The subsoil is strongly acid or very strongly acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist. It tends to crust and puddle, however, after hard rains, especially in cultivated areas where it contains subsoil material. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for corn, soybeans, and small grain. The wetness delays planting, however, in most years. Unless the surface is protected, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces. Tilling when the soil is wet causes surface compaction and reduces

the rate of water infiltration. Returning crop residue to the soil and regularly adding other organic material increase the infiltration rate and improve tilth.

The seasonal wetness and the moderate shrink-swell potential are limitations if this soil is used as a site for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIe.

13B2—Bluford silt loam, 2 to 5 percent slopes, eroded. This gently sloping, somewhat poorly drained soil is on the sides of ridges and along drainageways in the uplands. Individual areas are irregular in shape and range from 3 to 80 acres in size.

Typically, the surface layer is dark yellowish brown silt loam about 6 inches thick. The subsoil to a depth of more than 60 inches is mottled, firm silty clay loam. The upper part is yellowish brown, and the lower part is pale brown. In severely eroded areas the surface layer is silty clay loam. In some areas the lower part of the subsoil contains less sand. In other areas the subsoil contains less clay throughout.

Included with this soil in mapping are small areas of the moderately well drained Ava soils. These soils are in the more sloping areas along drainageways. They contain less clay in the subsoil than the Bluford soil. They make up 5 to 15 percent of the unit.

Water and air move through the upper part of the Bluford soil at a moderately slow rate and through the lower part at a slow rate. Surface runoff is medium. A seasonal high water table is at a depth of 1 to 3 feet from March through June in most years. Available water capacity is high. The surface layer typically is neutral because of past liming practices but is very strongly acid or strongly acid if not limed. The subsoil is medium acid to extremely acid. Organic matter content is low. The surface layer tends to crust and puddle after hard rains because it generally contains firm subsoil material. Small watercourses and seepy areas are common. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. Some are used for pasture and hay. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops and well suited to pasture and hay. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for corn, soybeans, and small grain. The wetness delays planting, however, in most years. Also, further erosion is a hazard. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

The seasonal wetness and the moderate shrink-swell potential are limitations if this soil is used as a site for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or a evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIe.

14B—Ava silt loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is on the crests of narrow ridges in the uplands. Individual areas are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The subsurface layer is yellowish brown silt loam about 6 inches thick. The subsoil is about 40 inches thick. The upper part is yellowish brown, firm silt loam and dark yellowish brown, brown, and strong brown, mottled, firm silty clay loam, and the lower part is brown and yellowish brown, mottled, brittle silt loam. The underlying material to a depth of 60 inches is brown, mottled, friable loam. In some areas the subsoil contains more sand and gravel. In other areas the slope is more than 5 percent. In places the lower part of the subsoil contains less sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Bluford soils on the lower ridges and on side slopes. These soils contain more clay in the subsoil than the Ava soil. They make up less than 10 percent of the unit.

Water and air move through the upper part of the Ava soil at a moderate rate and through the lower part at a very slow rate. Surface runoff is medium. A perched seasonal high water table is at a depth of 2 to 4 feet from March through June in most years. Available water capacity is moderate. The surface layer commonly is slightly acid because of past liming practices but in some areas is very strongly acid. The subsoil is extremely acid to strongly acid. Organic matter content is moderately

low. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is moderately suited to dwellings without basements and poorly suited to dwellings with basements and to septic tank absorption fields.

Measures that control erosion are needed in the areas used for soybeans, corn, or small grain. Examples are a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, and terraces. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

The seasonal wetness and the shrink-swell potential are limitations if this soil is used as a site for dwellings. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the foundations lowers the water table.

The seasonal wetness and the very slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed.

The capability subclass is IIe.

14C2—Ava silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is along drainageways and on the lower sides of morainal hills. Individual areas are irregular in shape and are 5 to 20 acres in size.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown and pale brown, firm silty clay loam and silt loam, and the lower part is light brownish gray, firm and brittle silt loam. In some areas the lower part of the subsoil is not so brittle. In other areas the slope is more than 10 percent. In some places the subsoil contains more sand and gravel. In other places the surface layer is silty clay loam because it has been mixed with part of the subsoil through cultivation.

Included with this soil in mapping are small areas of the well drained, moderately permeable Parke soils on the higher ridges and some areas of the somewhat poorly drained Bluford soils on the lower ridges. Bluford soils contain more clay in the subsoil than the Ava soil. Included soils make up less than 15 percent of the unit.

Water and air move through the upper part of the Ava soil at a moderate rate and through the lower part at a very slow rate. Surface runoff is rapid. A perched seasonal high water table is at a depth of 2 to 4 feet from March through June in most years. Available water capacity is moderate. The surface layer typically is medium acid because of past liming practices but is very strongly acid if not limed. The subsoil is strongly acid to extremely acid. Organic matter content is low. The surface layer is friable. It tends to crust or puddle after hard rains, however, especially in cultivated areas where it contains subsoil material. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops and well suited to pasture and hay. It is moderately suited to dwellings without basements and poorly suited to dwellings with basements and to septic tank absorption fields.

Measures that control erosion are needed in the areas used for soybeans, corn, or small grain. Examples are a system of conservation tillage that leaves crop residue on the surface after planting, contour farming or terraces, and a crop rotation that includes 1 or more years of forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

The seasonal wetness and the shrink-swell potential are limitations if this soil is used as a site for dwellings. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the foundations lowers the water table.

The seasonal wetness and the very slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed.

The capability subclass is IIIe.

15C2—Parke silt loam, 5 to 12 percent slopes, eroded. This moderately sloping, well drained soil is on ridges and side slopes in the uplands. Individual areas are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is dark brown silt loam about 7 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is brown, firm silty clay loam; the next part is reddish brown, firm clay loam;

and the lower part is yellowish red, friable clay loam and loam. In severely eroded areas the surface layer is silty clay loam. In some areas the subsoil contains more sand. In other areas it contains less sand. In some places the lower part of the subsoil is firm and brittle. In other places the redder colored clay loam or sandy clay loam is deeper.

Included with this soil in mapping are small areas of the moderately well drained, very slowly permeable Ava soils on the lower ridges. These soils make up 5 to 10 percent of the unit.

Water and air move through the Parke soil at a moderate rate. Surface runoff is medium. Available water capacity is high. The surface layer commonly is neutral because of past liming practices. The subsoil is strongly acid. Organic matter content is low. The surface layer is friable and can be easily tilled when moist. It tends to crust and puddle after hard rains, however, especially in areas where it has been mixed with part of the subsoil through cultivation. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. Some are used for pasture and hay. Others are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops and well suited to pasture and hay. It is moderately suited to dwellings and septic tank absorption fields.

Measures that control erosion are needed in the areas used for soybeans, corn, or small grain. Examples are a system of conservation tillage that leaves crop residue on the surface after planting, contour farming or terraces, and a crop rotation that includes 1 or more years of forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

The slope is a limitation if this soil is used as a site for dwellings or septic tank absorption fields. Also, the shrink-swell potential is a limitation on sites for dwellings without basements. Reinforcing footings and foundations, however, helps to prevent the structural damage caused by shrinking and swelling. Establishing benches by cutting and filling helps to overcome the slope on sites for dwellings. Compacting the fill improves stability. Extending footings in the fill areas into the undisturbed soil helps to prevent structural damage. Installing septic tank absorption fields on the contour helps to overcome the slope.

The capability subclass is IIIe.

16—Rushville silt loam. This nearly level, poorly drained soil is on broad, loess-covered till plains in the uplands. It is subject to brief periods of ponding from March through June. Individual areas are irregular in shape and range from 5 to 60 acres in size.

Typically, the surface layer is grayish brown silt loam about 8 inches thick. The subsurface layer is gray and light gray, mottled silt loam about 12 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled and very firm. The upper part is grayish brown silty clay, and the lower part is light brownish gray silty clay loam. In some areas the upper part of the subsoil contains less clay. In other areas the surface layer is darker. In places the lower part of the subsoil contains more sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Darmstadt soils on broad ridges and knolls. These soils have a high content of sodium in the subsoil. They make up 5 to 15 percent of the unit.

Water and air move through the Rushville soil at a slow rate. Surface runoff is slow or ponded. A perched seasonal high water table is 1 foot above the surface to 1 foot below from March through June in most years. Available water capacity is high. Reaction in the surface layer commonly is very strongly acid but varies because of local liming practices. The subsoil is strongly acid to neutral. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist. It tends to crust and puddle, however, after hard rains. The shrink-swell potential is high in the subsoil.

Most areas are used for cultivated crops. A few small areas are used as woodland. Some areas are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops and woodland. Because of the ponding, it generally is unsuited to dwellings and septic tank absorption fields.

A drainage system is needed in the areas used for soybeans, corn, or small grain. One has been installed in most areas. A combination of scattered subsurface drains and surface inlets and of shallow ditches and drainage outlets reduces the wetness. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Minimizing tillage and returning crop residue to the soil help to maintain tilth and fertility.

In the wooded areas the seasonal wetness results in moderate seedling mortality and severe plant competition and limits the use of mechanical equipment. The trees selected for planting should be those that can withstand the wet periods. Replanting and weeding during the early growth period help to keep the stand fully stocked and control weeds and brush. Measures that keep out grazing animals are needed. Timely pruning and thinning improve the woodland.

The capability subclass is IIIw.

46—Herrick silt loam. This nearly level, somewhat poorly drained soil is on broad till plains. Individual areas are irregular in shape and are 5 to 20 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 13 inches thick. The subsurface layer is dark grayish brown, mottled silt loam about 5 inches thick. The subsoil to a depth of more than 60 inches is mottled silty clay loam. The upper part is yellowish brown and firm, the next part is grayish brown and firm, and the lower part is light olive gray and friable. In some areas the surface soil is thinner or lighter in color. In other areas the subsoil contains less clay. In places a seasonal high water table is within a depth of 1 foot.

Included with this soil in mapping are small areas of Darmstadt soils on the slightly higher ridges. Also included are some areas of the poorly drained Piasa soils on the lower plains. Darmstadt and Piasa soils have a high content of sodium in the subsoil. They make up 5 to 15 percent of the unit.

Water and air move through the Herrick soil at a moderately slow rate. Surface runoff is slow. A seasonal high water table is at a depth of 1 to 3 feet from March through June in most years. Available water capacity is high. Reaction in the surface layer commonly is slightly acid but varies because of local liming practices. The subsoil is slightly acid or medium acid. Organic matter content is moderate. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is high in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

In the areas used for soybeans, corn, or small grain, the wetness delays planting in some years. A combination of scattered subsurface drains and surface inlets is needed in some areas. Erosion is a hazard in some areas. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

If this soil is used as a site for dwellings, the high shrink-swell potential and the seasonal wetness are limitations. Reinforcing footings and foundations helps to prevent the damage caused by shrinking and swelling. Installing subsurface drains around the foundations lowers the water table.

If this soil is used as a septic tank absorption field, the moderately slow permeability and the seasonal wetness are limitations. Tile drains lower the water table to more than 6 feet. Enlarging the absorption field helps to overcome the moderately slow permeability. The septic tank system functions more satisfactorily if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed.

The capability subclass is IIw.

48—Ebbert silt loam. This nearly level, poorly drained soil is in depressions on till plains. It is subject to brief periods of ponding from April through June. Individual areas are oval and range from 3 to 40 acres in size.

Typically, the surface layer is very dark gray silt loam about 16 inches thick. The subsurface layer is dark gray, mottled silt loam about 6 inches thick. The subsoil is gray, mottled, firm silty clay loam about 32 inches thick. The underlying material to a depth of 60 inches is mottled gray and dark grayish brown, firm silty clay loam. In some areas the surface soil is thinner. In other areas the subsoil contains less clay. In places the lower part of the surface soil is darker.

Included with this soil in mapping are small areas of Piasa soils near the edge of the depressions. These soils have a high content of sodium in the subsoil. They make up 5 to 15 percent of the unit.

Water and air move through the Ebbert soil at a slow rate. Surface runoff is slow or ponded. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below from April through July in most years. Available water capacity is very high. Reaction in the surface layer commonly is slightly acid but varies because of local liming practices. The subsoil is slightly acid or medium acid. Organic matter content is moderate. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for soybeans, corn, and small grain. Measures that maintain the drainage system are needed. Subsurface drains are needed in some areas. Soil blowing is a hazard. It can be controlled, however, by leaving crop residue on the surface and by establishing field windbreaks. Tilling when the soil is wet causes surface cloddiness and compaction. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

The seasonal wetness and the high shrink-swell potential are limitations if this soil is used as a site for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water also reduce the wetness.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption

field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on this soil.

The capability subclass is IIw.

50—Virden silt loam. This nearly level, poorly drained soil is in low areas on broad till plains. It is subject to brief periods of ponding from March through June. Individual areas are oval or irregularly shaped and range from 5 to 110 acres in size.

Typically, the surface layer is black silt loam about 8 inches thick. The subsurface layer is black silty clay loam about 4 inches thick. The subsoil is mottled, firm silty clay loam about 38 inches thick. The upper part is very dark gray and grayish brown, and the lower part is light brownish gray. The underlying material to a depth of 60 inches is gray and dark gray, mottled silt loam. In some areas the subsurface layer is light colored. In other areas the surface soil is more than 24 inches thick. In some places the subsoil contains less clay. In other places the depth to a seasonal high water table is more than 2 feet.

Included with this soil in mapping are small, closely intermingled areas of Piasa soils. These soils have a high content of sodium in the subsoil. They make up 10 to 20 percent of the unit.

Water and air move through the Virden soil at a moderately slow rate. Surface runoff is slow or ponded. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below from March through June in most years. Available water capacity is high. Reaction in the surface layer commonly is slightly acid but varies because of local liming practices. The subsoil is slightly acid or neutral. Organic matter content is high. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is high in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It generally is unsuited to dwellings and septic tank absorption fields because of the ponding.

This soil is sufficiently drained for soybeans, corn, and small grain. Measures that maintain the drainage system are needed. Subsurface drains are needed in some areas. Soil blowing is a hazard. It can be controlled, however, by leaving crop residue on the surface and by establishing field windbreaks. Tilling when the soil is wet causes surface cloddiness and compaction. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

The capability subclass is IIw.

70—Beaucoup silty clay loam. This nearly level, poorly drained soil is in swales on bottom land. It is frequently flooded for brief periods from March through June. Individual areas are long and narrow and range from 2 to 50 acres in size.

Typically, the surface layer is very dark grayish brown silty clay loam about 7 inches thick. The subsurface layer is very dark gray, mottled silty clay loam about 12 inches thick. The subsoil is mottled, firm silty clay loam about 24 inches thick. It is dark gray in the upper part, very dark gray in the next part, and very dark grayish brown in the lower part. The underlying material to a depth of 60 inches is gray and dark gray, mottled silt loam and silty clay loam. In some areas the surface soil is thicker. In other areas the subsoil contains more clay. In some places the soil is stratified and lacks a subsoil. In other places, the surface soil is lighter colored and a dark buried soil is at a depth of 20 to 50 inches. In some areas the depth to a seasonal high water table is more than 2 feet.

Included with this soil in mapping are small areas of the moderately well drained Huntsville soils on the slightly higher parts of the bottom land. These soils make up 5 to 15 percent of the unit.

Water and air move through the Beaucoup soil at a moderate rate. Surface runoff is slow or ponded. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below from March through June. Available water capacity is very high. Reaction in the surface layer commonly is slightly acid but varies because of local liming practices. The subsoil is slightly acid to mildly alkaline. Organic matter content is high. The surface layer is firm and tends to crust and puddle after hard rains. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. Some are used for pasture, hay, or woodland. This soil is moderately suited to cultivated crops, pasture, and hay and well suited to woodland. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

A drainage system is needed in the areas used for soybeans, corn, or small grain. One has been installed in most areas. In some areas, however, a combination of surface ditches or subsurface drains and drainage outlets is needed. The flooding does not occur during the growing season in most years. Soil blowing is a hazard. It can be controlled, however, by leaving crop residue on the surface and by establishing windbreaks. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Including grasses and legumes in the cropping sequence helps to maintain tilth. Selection of suitable species for planting, proper stocking rates, applications of fertilizer, and restricted use during wet periods help to keep the pasture and the soil in good condition.

In the wooded areas the flooding and the seasonal wetness result in moderate seedling mortality and severe plant competition and restrict the use of mechanical equipment. The trees that can withstand the frequent periods of flooding and the wetness should be selected for planting. Measures that control the floodwater are needed during periods when the site is prepared and seedlings are established. Replanting and weeding during the early growth period help to keep the stand fully stocked and control weeds and brush. Harvesting methods that leave protective borders and do not isolate the remaining trees minimize windthrow losses. Timely pruning and thinning improve the woodland. Measures that prevent fires and keep out grazing animals are needed.

The capability subclass is IIw.

77A—Huntsville silt loam, 0 to 3 percent slopes. This nearly level, moderately well drained soil is on natural levees on bottom land. It is occasionally flooded for brief periods from April through June. Individual areas are long and narrow and are 5 to 30 acres in size.

Typically, the surface soil is very dark grayish brown and dark brown silt loam about 26 inches thick. It is mottled in the lower part. The underlying material to a depth of 60 inches is brown and dark yellowish brown, mottled silt loam. It is stratified in the lower part. In some areas the surface soil is less than 24 inches thick. In other areas it is lighter in color. In some places the subsoil contains more sand. In other places the surface layer is very fine sandy loam to fine sand. In some areas the depth to a seasonal high water table is less than 4 feet.

Included with this soil in mapping are small areas of the poorly drained Birds soils on broad, low lying flats on the bottom land. These soils make up 5 to 10 percent of the unit.

Water and air move through the Huntsville soil at a moderate rate. Surface runoff is slow. A seasonal high water table is at a depth of 4 to 6 feet from March through June in most years. Available water capacity is high. Reaction is neutral throughout the soil. Organic matter content is moderate. The surface layer is friable and can be easily tilled when moist.

Most areas are used for soybeans, corn, small grain, pasture, or hay. This soil is well suited to cultivated crops, hay, and pasture. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

In the areas used for soybeans, corn, or small grain, the flooding is a hazard but usually does not occur during the growing season. Soil blowing also is a hazard. It can be controlled, however, by establishing field windbreaks and by leaving crop residue on the surface. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Including grasses and legumes in the cropping sequence helps to maintain tilth. Selection of suitable species for planting, proper stocking rates, applications of fertilizer, and restricted use during wet periods help to keep the pasture and the soil in good condition.

The capability subclass is IIw.

77B—Huntsville loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is on flood plains along narrow streams. It is subject to rare flooding. Individual areas are long and narrow and range from 5 to 60 acres in size.

Typically, the surface layer is very dark grayish brown loam about 6 inches thick. The subsurface layer is very dark brown and very dark grayish brown loam about 13 inches thick. The underlying material to a depth of more than 60 inches is loam. It is dark brown in the upper part, brown in the next part, and dark yellowish brown in the lower part. In some areas the surface soil is thinner. In other areas the surface layer is lighter in color. In some places the soil contains less sand. In other places the depth to a seasonal high water table is less than 4 feet.

Included with this soil in mapping are small areas of the well drained Hickory soils on the higher side slopes. These soils make up 5 to 10 percent of the unit.

Water and air move through the Huntsville soil at a moderate rate. Surface runoff is medium. A seasonal high water table is at a depth of 4 to 6 feet from March through June in most years. Available water capacity is high. Reaction is neutral throughout the soil. Organic matter content is high. The surface layer is friable and can be easily tilled when moist.

Most areas are used for cultivated crops, pasture, or hay. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops, pasture, and hay. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

Erosion is a hazard in the areas used for soybeans, corn, or small grain. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting, by terraces, or by contour farming. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and increase the rate of water infiltration.

Including grasses and legumes in the cropping sequence helps to maintain tilth. Selection of suitable species for planting, proper stocking rates, applications of fertilizer, and restricted use during wet periods help to keep the pasture and the soil in good condition.

The capability subclass is IIe.

112—Cowden silt loam. This nearly level, poorly drained soil is on broad till plains. Individual areas are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsurface layer is gray silt loam about 10 inches thick. The subsoil is mottled, firm silty clay loam about 37 inches thick. The upper part is dark grayish brown, and the lower part is gray. The underlying material to a depth of 60 inches is light brownish gray, firm silt loam. In some areas the dark surface layer is more than 10 inches thick. In other areas the surface layer is lighter in color. In some places the subsoil contains less clay. In other places the depth to a seasonal high water table is more than 2 feet.

Included with this soil in mapping are small, closely intermingled areas of Piasa soils. These soils have a high content of sodium in the subsoil. They make up less than 20 percent of the unit.

Water and air move through the Cowden soil at a slow rate. Surface runoff is slow. A seasonal high water table is within a depth of 2 feet from March through June in most years. Available water capacity is high. The surface layer typically is slightly acid because of past liming practices but is medium acid if not limed. The subsoil is strongly acid in the upper part and neutral in the lower part. Organic matter content is moderate. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is high in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for soybeans, corn, and small grain. Measures that maintain or improve the drainage system are needed. A combination of subsurface drains and surface inlets is needed in some areas. Soil blowing is a hazard. It can be controlled, however, by leaving crop residue on the surface and by establishing field windbreaks. Tilling when the soil is wet causes surface cloddiness and compaction, decreases the rate of water infiltration, and causes excessive runoff. Returning crop residue to the soil, regularly adding other organic material, and minimizing tillage increase the infiltration rate and help to maintain good tilth.

The seasonal wetness and the high shrink-swell potential are limitations if this soil is used as a site for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water also help to overcome the wetness.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on this soil.

The capability subclass is IIw.

113A—Oconee silt loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on broad flats and ridges in the uplands. Individual areas are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 9 inches thick. The subsurface layer is grayish brown, mottled silt loam about 5 inches thick. The subsoil is about 40 inches thick. It is mottled and firm. It is yellowish brown silty clay in the upper part and light brownish gray silty clay loam and silt loam in the lower part. The underlying material to a depth of 70 inches is pinkish gray, mottled, friable silt loam. In some areas the surface layer is lighter in color. In other areas it is thicker. In places the depth to a seasonal high water table is less than 1 foot.

Included with this soil in mapping are small, closely intermingled areas of Darmstadt soils. These soils are light colored and have a high content of sodium in the subsoil. They make up 10 to 15 percent of the unit.

Water and air move through the Oconee soil at a slow rate. Surface runoff is slow. A seasonal high water table is at a depth of 1 to 3 feet from March through June in most years. Available water capacity is high. The surface layer typically is neutral because of past liming practices but is medium acid or slightly acid if not limed. The subsoil is medium acid or slightly acid. Organic matter content is moderate. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is high in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for soybeans, corn, and small grain. The wetness delays planting, however, in most years. It can be reduced by a combination of subsurface drains and surface inlets. Erosion is a hazard in some areas. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface cloddiness, surface compaction, and excessive runoff. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

The seasonal wetness and the high shrink-swell potential are limitations if this soil is used as a site for dwellings. Reinforcing footings and foundations helps to

prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on this soil.

The capability subclass is IIw.

113B—Oconee silt loam, 2 to 5 percent slopes. This gently sloping, somewhat poorly drained soil is on narrow ridges in the uplands. Individual areas are irregular in shape and range from 3 to 60 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 7 inches thick. The subsurface layer is grayish brown silt loam about 6 inches thick. The subsoil is mottled, firm silty clay loam about 45 inches thick. The upper part is brown, and the lower part is grayish brown. The underlying material to a depth of 62 inches is yellowish brown, mottled, firm silt loam. In some areas the surface layer is lighter in color. In other areas it is thicker and darker. In places the subsoil contains less clay.

Included with this soil in mapping are small, closely intermingled areas of Darmstadt soils. Also included are some areas of the moderately well drained Tamalco soils on the sides of ridges. Darmstadt and Tamalco soils have a high content of sodium in the subsoil. They make up 10 to 20 percent of the unit.

Water and air move through the Oconee soil at a slow rate. Surface runoff is medium. A seasonal high water table is at a depth of 1 to 3 feet from March through June in most years. Available water capacity is high. The surface layer typically is neutral because of past liming practices but is medium acid or slightly acid if not limed. The subsoil is medium acid to very strongly acid. Organic matter content is moderate. The surface layer is friable and can be easily tilled when moist. It tends to crust and puddle after hard rains, however, especially in cultivated areas where it contains subsoil material. The shrink-swell potential is high in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for soybeans, corn, and small grain. The wetness delays planting, however, in most years. It can be reduced by scattered subsurface drains. Erosion is a hazard. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting, by contour farming, or by terraces. Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration. Returning crop residue to the soil and regularly adding other organic material increase the infiltration rate and improve tilth.

The seasonal wetness and the high shrink-swell potential are limitations if this soil is used as a site for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIe.

113B2—Oconee silt loam, 2 to 5 percent slopes, eroded. This gently sloping, somewhat poorly drained soil is on the sides of ridges and along drainageways in the uplands. Individual areas are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsoil is mottled silty clay loam about 40 inches thick. The upper part is friable and yellowish brown, and the lower part is firm and pale brown. The underlying material to a depth of 60 inches is brown, mottled, friable silt loam. In severely eroded areas the surface layer is silty clay loam. In some areas the subsoil contains less clay. In other areas the lower part of the subsoil contains more sand.

Included with this soil in mapping are small, closely intermingled areas of Darmstadt soils. These soils are light colored and have a high content of sodium in the subsoil. They make up 5 to 15 percent of the unit.

Water and air move through the Oconee soil at a slow rate. Surface runoff is medium. A seasonal high water table is at a depth of 1 to 3 feet from March through June in most years. Available water capacity is moderate. The surface layer typically is slightly acid because of past liming practices but is medium acid if not limed. The subsoil is very strongly acid to slightly acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist. It tends to crust and puddle after hard rains, however, because it commonly contains subsoil material. The shrink-swell potential is high in the subsoil.

Most areas are used for cultivated crops or for pasture and hay. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops and well suited to pasture and hay. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for soybeans, corn, and small grain. The wetness delays planting, however, in some years. It can be reduced by scattered subsurface drains. Further erosion is a hazard. It can be controlled, however, by a system of conservation tillage that leaves

crop residue on the surface after planting and by contour farming or terraces. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

The seasonal wetness and the high shrink-swell potential are limitations if this soil is used as a site for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIe.

120—Huey silt loam. This nearly level, poorly drained soil is on broad till plains. Individual areas are irregular in shape and are 4 to 25 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 7 inches thick. The subsurface layer is grayish brown silt loam about 6 inches thick. The subsoil is light brownish gray, mottled, firm and very firm silty clay loam about 29 inches thick. The underlying material to a depth of 60 inches is gray, mottled, friable silt loam. In some areas the surface layer is darker. In other areas the subsoil contains more clay. In places the depth to a high concentration of sodium is greater.

Included with this soil in mapping are small, closely intermingled areas of Cisne soils. These soils are dark and have a low content of sodium in the subsoil. They make up 5 to 15 percent of the unit.

Water and air move through the Huey soil at a very slow rate. Surface runoff is slow. A perched seasonal high water table is within a depth of 2 feet from March through June in most years. Available water capacity is low. The surface layer typically is neutral but ranges to strongly acid. The subsoil is moderately alkaline or strongly alkaline. It has a high content of sodium. Organic matter content is moderately low. The surface layer is friable but tends to crust and puddle after hard rains. The shrink-swell potential is moderate.

Most areas are used for cultivated crops. Some are used for hay and pasture or as sites for dwellings and septic tank absorption fields. This soil is poorly suited to cultivated crops and well suited to hay and pasture. It is poorly suited to dwellings and septic tank absorption fields.

A drainage system is needed in the areas used for soybeans, corn, or small grain. Measures that improve fertility and control soil blowing also are needed. A combination of subsurface drains and surface inlets or of shallow ditches and drainage outlets can reduce the wetness. The high content of sodium in the subsoil results in moisture stress during dry periods and excess moisture during wet periods. Also, the sodium restricts the availability and uptake of some plant nutrients. Tilling when the soil is wet causes surface compaction and cloddiness and decreases the rate of water infiltration. Minimizing tillage, returning crop residue to the soil, and adding other organic material increase the infiltration rate and improve tilth and fertility. Applying lime in areas where the surface soil is medium acid or strongly acid improves fertility. Leaving crop residue on the surface and establishing field windbreaks help to control soil blowing.

A cover of pasture plants or hay improves tilth and helps to control soil blowing. Applications of fertilizer, applications of lime in areas where the surface soil is medium acid or strongly acid, weed control, pasture rotation, proper stocking rates, timely harvesting, and timely deferment of grazing help to keep the pasture or hayland in good condition.

The seasonal wetness and the moderate shrink-swell potential are limitations if this soil is used as a site for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water also help to overcome the wetness. Establishing or maintaining lawns is difficult because of the high content of sodium in the subsoil. Planting salt-tolerant grasses and frequently watering during dry periods improve the lawn.

The seasonal wetness and the very slow permeabilty are limitations if this soil is used as a septic tank absorption field. Also, the excessive sodium causes the soil to disperse when saturated. The dispersion reduces the absorption rate. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on this soil.

The capability subclass is IVw.

128B—Douglas silt loam, 2 to 7 percent slopes. This moderately sloping, well drained soil is on side slopes and ridges in the uplands. Individual areas are oval or oblong and are 5 to 25 acres in size.

Typically, the surface soil is very dark grayish brown silt loam about 11 inches thick. The subsoil extends to a depth of 60 inches. The upper part is yellowish brown, friable and firm silty clay loam; the next part is yellowish brown, firm silt loam; and the lower part is brown, friable

silt loam. In some areas the surface layer is lighter in color. In severely eroded areas it is silty clay loam. In places the slope is more than 7 percent.

Included with this soil in mapping are small areas of the very slowly permeable Tamalco soils on the lower part of ridges. These soils have a higher content of clay and sodium in the subsoil than the Douglas soil. They make up 5 to 10 percent of the unit.

Water and air move through the Douglas soil at a moderate rate. Surface runoff is medium. Available water capacity is high. The surface layer is neutral. The subsoil is medium acid or slightly acid. Organic matter content is moderate. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops or for pasture and hay. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops and to pasture and hay. It is moderately suited to dwellings and septic tank absorption fields.

Erosion is a hazard in the areas used for soybeans, corn, or small grain. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good conditon.

The moderate shrink-swell potential is a limitation if this soil is used as a site for dwellings. Reinforcing footings and foundations, however, helps to prevent the structural damage caused by shrinking and swelling. The moderate permeability is a limitation if the soil is used as a septic tank absorption field. Enlarging the absorption area, however, helps to overcome the slow absorption of the liquid waste.

The capability subclass is IIe.

164A—Stoy silt loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on broad flats and ridges in the uplands. Individual areas are irregular in shape and range from 3 to 115 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsurface layer is light yellowish brown silt loam about 7 inches thick. The subsoil is about 37 inches thick. It is mottled. The upper part is yellowish brown, friable silt loam; the next part is yellowish brown and dark yellowish brown, firm silty clay loam; and the lower part is dark yellowish brown, very firm silty clay loam and silt loam. The underlying material to a depth of 60 inches is yellowish brown, very firm silt loam. In some areas the subsoil contains more clay. In other areas the lower part of the subsoil contains more sand.

Included with this soil in mapping are small areas of the poorly drained Rushville soils on the lower parts of the landscape. These soils are ponded in the spring. Also included are small areas of the moderately well drained, very slowly permeable Hosmer soils on ridges. Included soils make up 10 to 25 percent of the unit.

Water and air move through the Stoy soil at a slow rate. Surface runoff is slow. A perched seasonal high water table is at a depth of 1 to 3 feet from February through April in most years. Available water capacity is high. The surface layer typically is strongly acid but may be very strongly acid unless limed. The subsoil is very strongly acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

In the areas used for corn, soybeans, or small grain, the wetness delays planting in some years. It can be reduced, however, by a combination of scattered subsurface drains and surface inlets. Erosion is a hazard in some areas. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

The seasonal wetness and the moderate shrink-swell potential are limitations if this soil is used as a site for dwellings. Installing subsurface drains around the footings lowers the water table. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on this soil.

The capability subclass is IIw.

164B—Stoy silt loam, 2 to 5 percent slopes. This gently sloping, somewhat poorly drained soil is on broad ridges in the uplands. Individual areas are irregular in shape and range from 5 to 100 acres in size.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsurface layer is yellowish brown silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled. The upper

part is dark yellowish brown, firm silty clay loam; the next part is brown, firm silty clay loam; and the lower part is brown and grayish brown, firm silt loam and silty clay loam. In some areas the subsoil contains more clay. In severely eroded areas the surface layer is silty clay loam. In places the lower part of the subsoil contains more sand.

Included with this soil in mapping are small areas of the moderately well drained, very slowly permeable Hosmer soils on the tops of the higher ridges and some areas of the poorly drained Rushville soils on the lower flats. Rushville soils are ponded in the spring. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Stoy soil at a slow rate. Surface runoff is medium. A perched seasonal high water table is at a depth of 1 to 3 feet from February through April in most years. Available water capacity is high. The surface layer typically is strongly acid but may be very strongly acid unless limed. The subsoil is very strongly acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist. It tends to crust and puddle after hard rains, however, especially in cultivated areas where it contains subsoil material. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

In the areas used for soybeans, corn, or small grain, erosion is a hazard unless the surface is protected. Also, the wetness delays planting in some years. It can be reduced, however, by scattered subsurface drains. Erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

The seasonal wetness and the moderate shrink-swell potential are limitations if this soil is used as a site for dwellings. Installing subsurface drains around the footings lowers the water table. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIe.

164B2—Stoy silt loam, 2 to 5 percent slopes, eroded. This gently sloping, somewhat poorly drained soil is on the sides of ridges and along drainageways in the uplands. Individual areas are irregular in shape and range from 3 to 40 acres in size.

Typically, the surface layer is yellowish brown silt loam about 6 inches thick. The subsoil is mottled silty clay loam about 38 inches thick. The upper part is firm and pale brown, the next part is firm and yellowish brown, and the lower part is very firm and dark yellowish brown. The underlying material to a depth of 60 inches is brown, very firm silt loam. In some areas the subsoil contains more clay. In severely eroded areas the surface layer is silty clay loam. In places the lower part of the subsoil contains more sand.

Included with this soil in mapping are small areas of Atlas and Darmstadt soils along drainageways. Atlas soils are severely eroded and contain more clay in the subsoil than the Stoy soil. Darmstadt soils have a high content of sodium in the subsoil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Stoy soil at a slow rate. Surface runoff is medium. A perched seasonal high water table is at a depth of 1 to 3 feet from February through April in most years. Available water capacity is moderate. The surface layer typically is neutral but may be very strongly acid unless limed. The subsoil is strongly acid or very strongly acid. Organic matter content is low. The surface layer tends to crust and puddle after hard rains because it commonly contains subsoil material. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops or for pasture. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops and well suited to pasture. It is poorly suited to dwellings and septic tank absorption fields.

In the areas used for soybeans, corn, or small grain, further erosion is a hazard unless the surface is protected. Also, the wetness delays planting in some years. It can be reduced, however, by scattered subsurface drains. Erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

The seasonal wetness and the moderate shrink-swell potential are limitations if this soil is used as a site for dwellings. Installing subsurface drains around the

footings lowers the water table. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIe.

214B—Hosmer silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on convex ridgetops and side slopes in the uplands. Individual areas are irregular in shape and range from 5 to 100 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 7 inches thick. The subsurface layer is dark brown and brownish yellow silt loam about 10 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, firm silty clay loam; the next part is dark yellowish brown, mottled, firm silty clay loam; and the lower part is dark yellowish brown, mottled, firm and brittle silty clay loam and silt loam. In some areas the subsoil contains more clay. In severely eroded areas the surface layer is silty clay loam. In places the lower part of the subsoil contains more sand.

Included with this soil in mapping are small areas of the well drained, moderately permeable Hickory and Parke soils on the steeper slopes. Also included are some areas of the somewhat poorly drained, slowly permeable Stoy soils on broad ridges. Included soils make up 5 to 20 percent of the unit.

Water and air move through the upper part of the Hosmer soil at a moderate rate and through the lower part at a very slow rate. Surface runoff is medium. A perched seasonal high water table is at a depth of 2.5 to 3.0 feet in March and April during most years. Available water capacity is moderate. The surface layer typically is medium acid but ranges from slightly acid to very strongly acid, depending on local liming practices. The subsoil is strongly acid or very strongly acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist. It tends to crust and puddle after hard rains, however, especially in cultivated areas where it contains subsoil material. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops or for pasture. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops and to pasture. It is moderately suited to dwellings and poorly suited to septic tank absorption fields.

Unless the surface is protected, erosion is a hazard in the areas used for soybeans, corn, or small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

The seasonal wetness is a limitation if this soil is used as a site for dwellings with basements. Foundation drains, however, lower the water table. The moderate shrink-swell potential is a limitation on sites for dwellings without basements. Reinforcing footings and foundations, however, helps to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness and the very slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIe.

214C2—Hosmer silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on the sides of ridges and along drainageways in the uplands. Individual areas are irregular in shape and range from 3 to 40 acres in size.

Typically, the surface layer is dark yellowish brown silt loam about 9 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, firm silty clay loam; the next part is brown, firm silty clay loam; and the lower part is brown, firm and brittle silt loam. In severely eroded areas the surface layer is silty clay loam. In some areas the lower part of the subsoil contains less sand. In other areas the subsoil contains more clay throughout.

Included with this soil in mapping are small areas of the well drained, moderately permeable Hickory and Negley soils on the steeper slopes. Also included are some areas of the somewhat poorly drained, slowly permeable Stoy soils on the lower ridges. Included soils make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Hosmer soil at a moderate rate and through the lower part at a very slow rate. Surface runoff is rapid. A perched seasonal high water table is at a depth of 2.5 to 3.0 feet in March and April during most years. Available water capacity is moderate. Reaction in the surface layer typically is very strongly acid but varies, depending on local liming practices. The subsoil is strongly acid or very strongly acid. Organic matter content is low. The surface layer tends to crust and puddle after hard rains, especially in cultivated areas where it contains subsoil

material. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops, pasture and hay, or woodland. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops and well suited to pasture and hay and woodland. It is moderately suited to dwellings and poorly suited to septic tank absorption fields.

Unless the surface is protected, further erosion is a hazard in the areas used for corn, soybeans, or small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming, terraces, or a cropping sequence that includes 1 or more years of forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

Erosion control is needed in the wooded areas, especially during periods when seedlings are established. Critical area treatment helps to establish a protective plant cover on the site before the trees are planted. Harvesting methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Seedlings survive and grow well if competing vegetation is controlled and an adequate fertility level is maintained. Measures that prevent fires and keep out grazing animals help to control erosion and promote tree growth. Timely pruning, thinning, and intermediate cutting improve the woodland.

The seasonal wetness is a limitation if this soil is used as a site for dwellings with basements. Foundation drains, however, lower the water table. The moderate shrink-swell potential is a limitation on sites for dwellings without basements. Reinforcing footings and foundations, however, helps to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness and the very slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIIe.

218—Newberry silt loam. This nearly level, poorly drained soil is on broad plains and in wide, shallow depressions in the uplands. Individual areas are irregularly shaped or oval and range from 5 to 100 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 6 inches thick. The subsurface layer is grayish brown, mottled silt loam about 13 inches thick. The subsoil is mottled, firm silty clay loam about 33 inches thick. The upper part is dark grayish brown, the next part is light brownish gray, and the lower part is dark grayish brown and grayish brown. The underlying material to a depth of 60 inches is dark grayish brown, mottled silty clay loam. In some areas the dark surface layer is more than 10 inches thick. In other areas the subsoil contains more clay. In places the surface soil is dark throughout.

Included with this soil in mapping are small areas of the somewhat poorly drained Darmstadt and Hoyleton soils on low ridges. Darmstadt soils have a high content of sodium in the subsoil. Hoyleton soils contain more clay in the subsoil than the Newberry soil. Also included are small areas of Huey soils, which have a high content of sodium in the subsoil. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Newberry soil at a slow rate. Surface runoff is slow. A seasonal high water table is within a depth of 2 feet from March through June in most years. Available water capacity is high. Reaction in the surface layer typically is medium acid but varies, depending on local liming practices. The subsoil is medium acid to very strongly acid. Organic matter content is moderate. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for soybeans, corn, and small grain. Measures that maintain or improve the drainage system are needed. A combination of scattered subsurface drains and surface inlets is needed in some areas. Soil blowing is a hazard. It can be controlled, however, by leaving crop residue on the surface and by establishing field windbreaks. Tilling when the soil is wet causes surface cloddiness and compaction and decreases the rate of water infiltration. Returning crop residue to the soil, regularly adding other organic material, and minimizing tillage increase the infiltration rate and help to maintain good tilth.

The seasonal wetness and the moderate shrink-swell potential are limitations if this soil is used as a site for dwellings. Installing subsurface drains around footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water also help to overcome the wetness. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on this soil.

The capability subclass is IIw.

242B—Kendall silt loam, 1 to 5 percent slopes. This gently sloping, somewhat poorly drained soil is on terraces. It is subject to rare flooding. Individual areas are irregular in shape and are 5 to 35 acres in size.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 5 inches thick. The subsoil is about 38 inches thick. It is mottled and firm. The upper part is brown silty clay loam, the next part is light brownish gray silty clay loam, and the lower part is pale brown silt loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, firm silt loam. In some areas the subsoil contains more sand. In other areas it contains more clay. In places the surface layer is silty clay loam because it has been mixed with the upper part of the subsoil through cultivation.

Included with this soil in mapping are small areas of well drained or moderately well drained soils on the higher parts of the terraces and on side slopes. Also included are small areas of poorly drained soils on the lower parts of the terraces. Included soils make up 5 to 20 percent of the unit.

Water and air move through the Kendall soil at a moderate rate. Surface runoff is medium. A seasonal high water table is at a depth of 1 to 3 feet from March through June in most years. Available water capacity is high. Reaction in the surface layer typically is slightly acid but varies, depending on local liming practices. The subsoil is medium acid to very strongly acid. Organic matter content is moderately low. The surface layer is very friable and can be easily tilled when moist. It tends to crust and puddle after hard rains, however, especially in cultivated areas where it contains subsoil material. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops or for pasture. This soil is well suited to cultivated crops and pasture. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

In the areas used for corn, soybeans, or small grain, erosion is a hazard. Also, the wetness delays planting in most years. It can be reduced, however, by a combination of scattered subsurface drains and surface inlets. Erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

The capability subclass is IIe.

284—Tice silty clay loam. This nearly level, somewhat poorly drained soil is in broad swales on bottom land. It is occasionally flooded for brief periods from January through June. Individual areas are long and narrow and range from 10 to 40 acres in size.

Typically, the surface layer is very dark grayish brown, firm silty clay loam about 10 inches thick. The subsurface layer is dark grayish brown and very dark grayish brown, firm silty clay loam about 7 inches thick. The subsoil is mottled, firm silty clay loam about 36 inches thick. The upper part is dark yellowish brown, the next part is grayish brown, and the lower part is dark yellowish brown. The underlying material to a depth of 60 inches is yellowish brown, mottled, firm silt loam. In some areas the surface layer is lighter in color. In other areas the soil contains less clay throughout. In places the dark surface soil is more than 24 inches thick.

Included with this soil in mapping are small areas of the moderately well drained Huntsville soils on natural levees. Also included are small areas of the poorly drained Beaucoup soils in low swales. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Tice soil at a moderate rate. Surface runoff is slow. A seasonal high water table is at a depth of 1 to 3 feet from March through June in most years. Available water capacity is high. The surface layer is neutral. The subsoil is slightly acid or neutral. Organic matter content is moderate. The surface layer tends to crust and puddle after hard rains. The shrink swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. Some are used as woodland. This soil is well suited to cultivated crops and to woodland. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

In the areas used for soybeans, corn, or small grain, the wetness or the flooding delays planting in most years. Also, soil blowing is a hazard. It can be controlled, however, by leaving crop residue on the surface. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and minimizing tillage improve tilth and increase the rate of water infiltration.

In the wooded areas the trees selected for planting should be those that can withstand the occasional periods of flooding and the wetness. Seedlings survive and grow well if competing vegetation is controlled. Measures that prevent fires and keep out grazing

animals promote tree growth. Timely pruning, thinning, and intermediate cutting improve the woodland.

The capability subclass is IIw.

287A—Chauncey silt loam, 0 to 3 percent slopes. This nearly level, poorly drained soil is on concave foot slopes and in broad drainageways on uplands. Individual areas are long and narrow and range from 5 to 50 acres in size.

Typically, the surface layer is very dark grayish brown silt loam about 13 inches thick. The subsurface layer is dark grayish brown and grayish brown, mottled silt loam about 15 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled. The upper part is dark gray, very firm silty clay; the next part is gray, firm silty clay loam; and the lower part is light gray, firm silty clay loam. In some areas the surface soil is less than 24 inches thick. In other areas the subsoil contains less clay. In places the depth to a seasonal high water table is more than 2 feet.

Water and air move through this soil at a slow rate. Surface runoff is slow. A perched seasonal high water table is within a depth of 2 feet from February through June in most years. Available water capacity is high. The surface layer typically is slightly acid because of past liming practices but may be very strongly acid if not limed. The subsoil ranges from strongly acid to slightly acid. Organic matter content is moderate. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is high in the subsoil.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for soybeans, corn, and small grain. Measures that maintain or improve the drainage system are needed. A combination of scattered subsurface drains and surface inlets is needed in some areas. Unless the surface is protected, erosion is a hazard in some areas. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

The seasonal wetness and the high shrink-swell potential are limitations if this soil is used as a site for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water also help to overcome the wetness.

The seasonal wetness and the slow permeabilty are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on this soil.

The capability subclass is IIIw.

331—Haymond silt loam. This nearly level, well drained soil is on bottom land. It is occasionally flooded for brief periods from January through May. Individual areas are long and narrow and range from 10 to 40 acres in size.

Typically, the surface layer is brown silt loam about 10 inches thick. The underlying material to a depth of 60 inches is friable silt loam. It is brown in the upper part and very dark grayish brown in the lower part. The lower part has thin strata of very fine sand. In some areas the surface layer is darker. In other areas a dark layer is within a depth of 40 inches. In places the lower part of the underlying material contains more sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Lawson and Wakeland soils on the lower parts of the bottom land. These soils make up 5 to 10 percent of the unit.

Water and air move through the Haymond soil at a moderate rate. Surface runoff is slow. Available water capacity is very high. The surface layer commonly is neutral. The underlying material is neutral or slightly acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist.

Most areas are used for cultivated crops or small grain. Some small areas are used for pasture or woodland. This soil is well suited to cultivated crops and pasture and very well suited to woodland. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

In the areas used as cropland, the flooding is a hazard but does not occur during the growing season in most years. Soil blowing also is a hazard. It can be controlled, however, by leaving crop residue on the surface and by establishing field windbreaks. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Including grasses and legumes in the cropping sequence helps to maintain tilth. Selection of suitable species for planting, proper stocking rates, applications of fertilizer, and restricted use during wet periods help to keep the pasture and the soil in good condition.

In the wooded areas the trees selected for planting should be those that can withstand the periods of flooding and the wetness. Seedlings survive and grow well if competing vegetation is controlled. Measures that prevent fires and keep out grazing animals promote tree

growth. Timely pruning, thinning, and intermediate cutting improve the woodland.

The capability subclass is IIw.

333—Wakeland silt loam. This nearly level, somewhat poorly drained soil is on narrow bottom land and on natural levees along the major streams. It is occasionally flooded for brief periods from January through May. Individual areas commonly are long and narrow and range from 10 to 200 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 10 inches thick. The underlying material to a depth of 60 inches is mottled, friable silt loam. The upper part is dark grayish brown, and the lower part is a very dark gray buried horizon. In some areas the surface layer contains more clay. In other areas it is darker. In places the soil does not have a dark buried horizon below a depth of 40 inches. In some areas in the northwestern part of the county, thin layers of shale, siltstone, and coal are within 60 inches of the surface. In some areas a seasonal high water table is within 1 foot of the surface.

Included with this soil in mapping are small areas of the well drained Hickory soils on side slopes. These soils make up 5 to 10 percent of the unit.

Water and air move through the Wakeland soil at a moderate rate. Surface runoff is slow. A seasonal high water table is at a depth of 1 to 3 feet from January through April in most years. Available water capacity is very high. The surface layer commonly is slightly acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist.

Most areas are used for cultivated crops. Some are used for hay and pasture. This soil is moderately suited to cultivated crops and to hay and pasture. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

In the areas used for soybeans, corn, or small grain, the wetness or the flooding delays planting in most years. The flooding, however, generally does not occur during the growing season. Soil blowing is a hazard. It can be controlled, however, by leaving crop residue on the surface and by establishing field windbreaks. Tilling when the soil is wet causes surface cloddiness and excessive runoff and erosion. Returning crop residue to the soil and minimizing tillage help to maintain good tilth and increase the rate of water infiltration.

Including grasses and legumes in the cropping sequence helps to maintain tilth. Selection of suitable species for planting, proper stocking rates, applications of fertilizer, and restricted use during wet periods help to keep the pasture and the soil in good condition.

The capability subclass is IIw.

334—Birds silt loam. This nearly level, poorly drained soil is in broad, low lying areas on bottom land. It is frequently flooded for long periods from March through June. Individual areas are irregular in shape and range from 10 to 100 acres in size.

Typically, the surface layer is dark gray silt loam about 8 inches thick. The upper part of the underlying material is dark gray, light brownish gray, and grayish brown, mottled, friable silt loam. The lower part to a depth of more than 60 inches is gray, mottled, firm stratified silt loam and silty clay loam. In some areas a dark buried layer is below a depth of 40 inches. In other areas the underlying material is silty clay loam throughout. In places the depth to a seasonal high water table is more than 1 foot.

Included with this soil in mapping are small areas of the well drained Haymond soils near tributaries. These soils make up 5 to 10 percent of the unit.

Water and air move through the Birds soil at a moderately slow rate. Surface runoff is slow. A seasonal high water table is 0.5 foot above the surface to 1.0 foot below from March through June in most years. Available water capacity is very high. The surface layer commonly is neutral because of past liming practices, but in some areas it is medium acid. The underlying material is medium acid to mildly alkaline. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist.

Most areas are used for cultivated crops or for pasture and hay. Some small areas are used as woodland. This soil is moderately suited to cultivated crops, pasture, and hay and well suited to woodland. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

A drainage system is needed in the areas used for soybeans, corn, or small grain. One has been installed in most areas. The flooding is a hazard but does not occur during the growing season in most years. Measures that maintain the drainage system are needed. In some areas a combination of surface ditches or subsurface drains and drainage outlets is needed. Soil blowing is a hazard. It can be controlled, however, by leaving crop residue on the surface and by establishing field windbreaks. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Including grasses and legumes in the cropping sequence helps to maintain tilth. Selection of suitable species for planting, proper stocking rates, applications of fertilizer, and restricted use during wet periods help to keep the pasture and the soil in good condition.

In the wooded areas the trees selected for planting should be those that can withstand the frequent periods of flooding. The flooding and the excessive wetness result in moderate seedling mortality and severe plant competition and greatly limit the use of mechanical equipment. Measures that control the floodwater are needed, especially during site preparation and during

periods when seedlings are established. Replanting and weeding during the early growth period help to keep the stand fully stocked and control weeds and brush. Measures that prevent fires and keep out grazing animals are needed. Timely pruning and thinning improve the woodland.

The capability subclass is IIIw.

337A—Creal silt loam, 0 to 3 percent slopes. This nearly level, somewhat poorly drained soil is on concave foot slopes in the uplands. Individual areas are irregular in shape and range from 5 to 80 acres in size.

Typically, the surface layer is dark brown silt loam about 8 inches thick. The subsurface layer is dark yellowish brown and yellowish brown, friable silt loam about 17 inches thick. The subsoil is about 28 inches thick. It is mottled. The upper part is yellowish brown, friable silt loam; the next part is yellowish brown and brown, firm silty clay loam and silt loam; and the lower part is grayish brown, friable silt loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam. In some areas the subsurface layer is thinner. In other areas the subsoil contains more clay. In places the surface layer has been thickened because it has received local alluvium from adjacent upland soils.

Included with this soil in mapping are small areas of the well drained Parke and Pike soils. These soils are on side slopes above areas of the Creal soil. They make up 5 to 15 percent of the unit.

Water and air move through the Creal soil at a moderately slow rate. Surface runoff is slow. A seasonal high water table is at a depth of 1 to 3 feet from February through May in most years. Available water capacity is very high. The surface layer typically is neutral because of past liming practices but is medium acid or strongly acid if not limed. The subsoil is strongly acid or very strongly acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist. It tends to crust and puddle, however, after hard rains. The shrink-swell potential is moderate in the subsoil.

Most areas are cultivated or are used for hay and pasture. This soil is well suited to cultivated crops and to hay and pasture. It is poorly suited to dwellings and septic tank absorption fields.

In the areas used for corn, soybeans, or small grain, the wetness delays planting in some years. It can be reduced, however, by surface ditches and subsurface drains if drainage outlets are available. Unless the surface is protected, erosion is a hazard in some areas. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

The seasonal wetness is a limitation if this soil is used as a site for dwellings. Also, the moderate shrink-swell potential is a limitation on sites for dwellings without basements. Foundation drains lower the water table. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

The moderately slow permeability and the seasonal wetness are limitations if this soil is used as a septic tank absorption field. Tile drains can lower the water table to a depth of more than 6 feet. Enlarging the absorption area helps to overcome the moderately slow permeability. A septic tank system can function more satisfactorily if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed.

The capability subclass is IIw.

404—Titus silty clay loam. This nearly level, poorly drained soil is in broad swales on bottom land. It is frequently flooded for brief periods from March through June. Individual areas are irregular in shape and range from 5 to 100 acres in size.

Typically, the surface layer is very dark gray silty clay loam about 8 inches thick. The subsurface layer is about 12 inches thick. It is mottled and very firm. The upper part is very dark gray silty clay loam, and the lower part is black silty clay. The subsoil is dark gray, mottled, very firm silty clay loam about 30 inches thick. The underlying material to a depth of 60 inches is dark gray, mottled silty clay loam. In some areas the subsoil contains less clay. In other areas it is darker. In places the surface soil is thicker.

Included with this soil in mapping are small areas of the somewhat poorly drained, moderately permeable Wakeland soils on the higher parts of the bottom land. Also included are some areas of the well drained Hickory soils on side slopes above areas of the Titus soil. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Titus soil at a slow rate. Surface runoff is slow. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below from March through June in most years. Available water capacity is moderate. The surface layer is neutral. The subsoil is slightly acid or neutral. Organic matter content is high. The surface layer is very firm and cannot be easily tilled.

Most areas are used for woodland. A few small areas are used for cultivated crops. This soil is well suited to woodland and poorly suited to cultivated crops. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

A drainage system has been installed in the few areas used for soybeans, corn, or small grain. The flooding is a

hazard but does not occur during the growing season in most years. Measures that maintain the drainage system are needed. In some areas a combination of surface ditches or subsurface drains and drainage outlets is needed. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and minimizing tillage improve tilth and increase the rate of water infiltration.

In the wooded areas the trees selected for planting should be those that can withstand the frequent periods of flooding. The flooding and the excessive wetness result in severe seedling mortality and severe plant competition and greatly limit the use of mechanical equipment. Measures that control the floodwater are needed, especially during site preparation and during periods when seedlings are established. Replanting and weeding during the early growth period help to keep the stand fully stocked and control competing vegetation. Harvesting methods that do not isolate the remaining trees or leave them closely spaced help to prevent windthrow. Measures that prevent fires and keep out grazing animals are needed. Timely pruning and thinning improve the woodland.

The capability subclass is IVw.

451—Lawson silt loam. This nearly level, somewhat poorly drained soil is on low ridges on bottom land. It is occasionally flooded for brief periods from March through June. Individual areas are long and narrow and are 5 to 30 acres in size.

Typically, the surface soil is very dark grayish brown silt loam about 28 inches thick. The underlying material to a depth of 60 inches is dark grayish brown and mottled grayish brown, dark grayish brown, and dark yellowish brown, friable silt loam. In some areas the surface layer is lighter in color. In other areas it is thinner. In a few areas the depth to a seasonal high water table is more than 3 feet.

Included with this soil in mapping are small areas of the poorly drained Beaucoup and Birds soils in depressions and swales. These soils make up 5 to 15 percent of the unit.

Water and air move through the Lawson soil at a moderate rate. Surface runoff is slow. A seasonal high water table is at a depth of 1 to 3 feet from November through May in most years. Available water capacity is very high. The surface layer is neutral. The subsoil is slightly acid to mildly alkaline. Organic matter content is high. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is moderate in the underlying material.

Most areas are used for cultivated crops. Some small areas are used for hay, pasture, or woodland. This soil is well suited to cultivated crops, pasture, hay, and woodland. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

This soil is sufficiently drained for soybeans, corn, and small grain. Flooding is a hazard but does not occur during the growing season in most years. Soil blowing also is a hazard. It can be controlled, however, by establishing field windbreaks and by leaving crop residue on the surface. Tilling when the soil is wet causes surface cloddiness and compaction. Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Including grasses and legumes in the cropping sequence helps to maintain tilth. Selection of suitable species for planting, proper stocking rates, applications of fertilizer, and restricted use during wet periods help to keep the pasture and the soil in good condition.

In the wooded areas the trees selected for planting should be those that can withstand the occasional periods of flooding and the wetness. Seedlings survive and grow well if competing vegetation is controlled. Measures that prevent fires and keep out grazing animals promote tree growth. Timely pruning, thinning, and intermediate cutting improve the woodland.

The capability subclass is IIw.

474—Piasa silt loam. This nearly level, poorly drained soil is on broad flats on till plains. Individual areas are irregular in shape and range from 5 to 80 acres in size.

Typically, the surface layer is very dark gray silt loam about 8 inches thick. The subsurface layer is grayish brown silt loam about 3 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is dark grayish brown, very firm silty clay loam; the next part is dark gray, mottled, very firm silty clay; and the lower part is gray and light brownish gray, mottled, very firm or firm silty clay loam. In some areas the soil does not have a subsurface layer. In other areas the surface layer is lighter in color.

Included with this soil in mapping are small, closely intermingled areas of Cowden and Virden soils. Also included are some areas of Ebbert soils in depressions that are subject to ponding and small areas of the somewhat poorly drained Herrick soils on the higher parts of the till plains. The included soils have a low content of sodium in the subsoil. They make up 10 to 20 percent of the unit.

Water and air move through the Piasa soil at a very slow rate. Surface runoff is slow. A perched seasonal high water table is within a depth of 2 feet from February through May in most years. Available water capacity is moderate. The surface layer typically is neutral because of past liming practices but may be medium acid if not limed. The subsoil is slightly acid to strongly alkaline. It has a high content of sodium. Organic matter content is moderate. The surface layer is friable and can be easily tilled when moist, but it tends to crust and puddle after hard rains. The shrink-swell potential is high in the subsoil.

Most areas are used for cultivated crops. Some are used for hay and pasture. This soil is moderately suited to cultivated crops and well suited to hay and pasture. It is poorly suited to dwellings and septic tank absorption fields.

In the areas used for soybeans, corn, or small grain, the wetness and the alkalinity are limitations. A combination of scattered subsurface drains and surface inlets or of shallow ditches and drainage outlets reduces the wetness. The high content of sodium in the subsoil results in moisture stress during dry periods and excess moisture during wet periods. Also, the sodium restricts the availability and uptake of some plant nutrients. Soil blowing is a hazard. It can be controlled, however, by leaving crop residue on the surface and by establishing field windbreaks. Tilling when the soil is wet causes surface cloddiness and compaction and decreases the rate of water infiltration. Minimizing tillage, returning crop residue to the soil, and regularly adding other organic material increase the infiltration rate and improve tilth and fertility.

A cover of hay or pasture plants maintains or improves tilth and helps to control soil blowing. Applications of fertilizer, weed control, pasture rotation, proper stocking rates, timely harvesting, and timely deferment of grazing help to keep the pasture or hayland in good condition.

The seasonal wetness and the high shrink-swell potential are limitations if this soil is used as a site for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water also help to overcome the wetness. Establishing or maintaining lawns is difficult because of the high content of sodium in the subsoil. Planting salt-tolerant grasses and frequently watering during dry periods improve the lawn.

The seasonal wetness and the very slow permeability are limitations if this soil is used as a septic tank absorption field. Also, the excessive sodium causes the soil to disperse when saturated. The dispersion reduces the absorption rate. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on this soil.

The capability subclass is IIIw.

517A—Marine silt loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on broad upland ridges. Individual areas are irregular in shape and range from 10 to 100 acres in size.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsurface layer is light brownish gray silt loam about 6 inches thick. The subsoil to a depth of more than 60 inches is mottled, firm silty clay loam. The upper part is grayish brown, the next part is brown and pale brown, and the lower part is light brownish gray. In some areas the surface layer is darker. In other areas the subsoil contains less clay. In places the depth to a seasonal high water table is less than 1 foot.

Included with this soil in mapping are small areas of the moderately well drained Hosmer soils on the higher ridgetops. These soils make up 5 to 10 percent of the unit.

Water and air move through the Marine soil at a slow rate. Surface runoff is slow. A perched seasonal high water table is at a depth of 1 to 2 feet from January through May in most years. Available water capacity is high. The surface layer is slightly acid because of past liming practices. The subsoil is medium acid to very strongly acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is high in the subsoil.

Most areas are cultivated. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for soybeans, corn, and small grain. Measures that maintain or improve the drainage system are needed. In some areas a combination of scattered subsurface drains and surface inlets is needed. Erosion is a hazard in some areas. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

The seasonal wetness and the high shrink-swell potential are limitations if this soil is used as a site for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on this soil.

The capability subclass is IIw.

517B—Marine silt loam, 2 to 4 percent slopes. This gently sloping, somewhat poorly drained soil is on ridges in the uplands. Individual areas are irregular in shape and range from 5 to 40 acres in size.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsurface layer is light gray, mottled silt loam about 9 inches thick. The subsoil to a depth of more than 60 inches is very firm or firm, mottled silty clay loam. The upper part is yellowish brown, and the lower part is grayish brown and light brownish gray. In

some areas the surface layer is darker. In other areas the subsurface layer is thinner or does not occur. In places the depth to a seasonal high water table is less than 1 foot.

Included with this soil in mapping are small areas of the moderately well drained Hosmer soils on the narrower ridgetops. These soils make up 5 to 10 percent of the unit.

Water and air move through the Marine soil at a slow rate. Surface runoff is medium. A perched seasonal high water table is at a depth of 1 to 2 feet from January through May in most years. Available water capacity is high. The surface layer is neutral because of past liming practices. The subsoil is medium acid to very strongly acid. Organic matter content is moderately low. The surface layer is very friable and can be easily tilled when moist. It tends to crust and puddle, however, after hard rains. The shrink-swell potential is high in the subsoil.

Most areas are cultivated or are used for pasture and hay. This soil is well suited to cultivated crops, pasture, and hay. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for soybeans, corn, and small grain. Measures that maintain or improve the drainage system are needed. In some areas scattered subsurface drains are needed. Unless the surface is protected, erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces. Tilling when the soil is wet causes surface cloddiness and compaction. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

The seasonal wetness and the high shrink-swell potential are limitations if this soil is used as a site for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table.

The seasonal wetness and the slow permeability are limitations if this soil is used as a septic tank absorption field. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIe.

570C3—Martinsville silt loam, 5 to 10 percent slopes, severely eroded. This moderately sloping, well drained soil is on the sides of terraces. It is subject to rare flooding. Individual areas are long and narrow and range from 5 to 40 acres in size.

Typically, the surface layer is dark yellowish brown silt loam about 6 inches thick. The subsoil is about 44 inches thick. It is strong brown. The upper part is friable silty clay loam, the next part is firm and friable clay loam, and the lower part is friable loam. The underlying material to a depth of 60 inches is strong brown, friable sandy loam. In some areas the surface layer is silty clay or silty clay loam. In other areas the subsoil contains more clay and less sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Lawson and Wakeland soils on bottom land. These soils make up 2 to 5 percent of the unit.

Water and air move through the Martinsville soil at a moderate rate. Surface runoff is rapid. Available water capacity is high. The surface layer is neutral because of past liming practices. The subsoil is medium acid. Organic matter content is low. The surface layer tends to crust and puddle after hard rains, especially in cultivated areas where it contains subsoil material. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops or for pasture and hay. This soil is poorly suited to cultivated crops and well suited to hay and pasture. It generally is unsuited to dwellings and septic tank absorption fields because of the flooding.

Unless the surface is protected, further erosion is a severe hazard in the areas used for soybeans, corn, or small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming, terraces, or a crop rotation that includes 1 or more years of forage crops. Tilling when the soil is wet causes excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material improve fertility.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

The capability subclass is IVe.

581B2—Tamalco silt loam, 1 to 5 percent slopes, eroded. This gently sloping, moderately well drained soil is on the sides of ridges in the uplands. Individual areas are oval or oblong and are 3 to 25 acres in size.

Typically, the surface layer is dark brown silt loam about 8 inches thick. The subsoil is about 45 inches thick. It is firm. The upper part is reddish brown silty clay, the next part is brown and pale brown, mottled silty clay loam that has a high content of sodium, and the lower part is brown, mottled silt loam. The underlying material to a depth of 60 inches is brown, mottled, firm silt loam. In some areas the surface layer is darker. In other areas, the upper part of the subsoil contains less clay and the

lower part is brittle. In places the depth to a seasonal high water table is less than 3 feet.

Included with this soil in mapping are small areas of the somewhat poorly drained Hoyleton and Oconee soils on the lower ridges and knolls and some areas of Richview soils on ridgetops. The included soils have a low content of sodium in the subsoil. They make up 5 to 15 percent of the unit.

Water and air move through the Tamalco soil at a very slow rate. Surface runoff is medium. A seasonal high water table is at a depth of 3 to 5 feet from February through April in most years. Available water capacity is moderate. Reaction in the surface layer generally is strongly acid but varies, depending on local liming practices. The subsoil is very strongly acid to moderately alkaline. It has a high content of sodium. Organic matter content is moderate. The surface layer tends to crust and puddle after hard rains, especially in areas where it is mildly alkaline. The shrink-swell potential is high in the subsoil.

Most areas are cultivated or are used for hay and pasture. This soil is moderately suited to cultivated crops and to hay and pasture. It is poorly suited to dwellings and septic tank absorption fields.

Unless the surface is protected, further erosion is a hazard in the areas used for soybeans, corn, or small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface, contour farming, or a crop rotation that includes 1 or more years of meadow or small grain. The high content of sodium in the subsoil results in moisture stress during dry periods and excess moisture during wet periods. Also, the sodium restricts the availability and uptake of some plant nutrients. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

The high shrink-swell potential is a limitation if this soil is used as a site for dwellings. Reinforcing footings and foundations, however, helps to prevent the structural damage caused by shrinking and swelling.

The very slow permeability and the seasonal wetness are limitations if this soil is used as a septic tank absorption field. Also, the excessive sodium in the subsoil causes the soil to disperse when saturated. The dispersion reduces the absorption rate. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIIe.

583B—Pike silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on the tops of morainal ridges in the uplands. Individual areas are irregular in shape and range from 5 to 150 acres in size.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsurface layer is yellowish brown silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, friable silt loam; the next part is strong brown, dark yellowish brown, and yellowish brown, firm silty clay loam; and the lower part is strong brown, friable silt loam. In some areas the surface layer is silty clay loam. In other areas the lower part of the subsoil contains more sand.

Included with this soil in mapping are small areas of the moderately well drained, very slowly permeable Hosmer and somewhat poorly drained, slowly permeable Marine soils on the lower ridgetops. These soils make up 5 to 15 percent of the unit.

Water and air move through the Pike soil at a moderate rate. Surface runoff is medium. Available water capacity is high. The surface layer typically is neutral because of past liming practices but is medium acid or strongly acid if not limed. The subsoil is strongly acid or very strongly acid. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist.

Most areas are used for cultivated crops. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops, dwellings, and septic tank absorption fields.

Unless the surface is protected, erosion is a hazard in the areas used for soybeans, corn, or small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and increase the rate of water infiltration.

The capability subclass is IIe.

585D—Negley silt loam, 10 to 15 percent slopes. This strongly sloping, well drained soil is on the crest and sides of mounds in the uplands. Individual areas are oval or irregularly shaped and are 5 to 25 acres in size.

Typically, the surface layer is dark brown silt loam about 8 inches thick. The subsurface layer is yellowish brown silt loam about 2 inches thick. The subsoil extends to a depth of more than 60 inches. It is firm. The upper part is dark brown and yellowish red clay loam, the next part is reddish brown clay loam, and the lower part is yellowish red sandy clay loam. In some areas the upper part of the subsoil contains less gravel and sand. In other areas the subsoil is less than 50 inches thick.

Included with this soil in mapping are small areas of the somewhat poorly drained Hoyleton soils. These soils are on foot slopes below areas of the Negley soil. They make up 5 to 15 percent of the unit.

Water and air move through the Negley soil at a moderate rate. Surface runoff is rapid. Available water capacity is high. The surface layer typically is neutral because of past liming practices but is very strongly acid to slightly acid if not limed. The subsoil is slightly acid to very strongly acid. Organic matter content is low. The surface layer is firm and tends to crust easily.

Most areas are used for cultivated crops or for pasture and hay. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops, pasture, and hay and very well suited to woodland. It is moderately suited to dwellings and septic tank absorption fields.

Unless the surface is protected, erosion is a hazard in the areas used for soybeans, corn, or small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or a crop rotation that includes 1 or more years of forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth and fertility.

A cover of hay or pasture plants helps to maintain or improve tilth and helps to control erosion and runoff. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are established. Applications of fertilizer, weed control, pasture rotation, proper stocking rates, timely harvesting, and timely deferment of grazing help to keep the pasture or hayland in good condition.

If this soil is used as woodland, erosion control is needed during periods when trees are planted or harvested. Seedlings survive and grow well if competing vegetation is controlled. A protective plant cover and measures that prevent fires and keep out grazing animals help to control erosion and promote tree growth. Timely pruning, thinning, and intermediate cutting improve the woodland.

The slope is a limitation if this soil is used as a site for dwellings. Establishing benches by cutting and filling helps to overcome the slope. Compacting the fill improves stability. Extending footings in the fill areas into the undisturbed soil helps to prevent structural damage. Diverting the runoff from the higher areas also helps to prevent this damage.

The slope is a limitation if this soil is used as a septic tank absorption field. The effluent may seep laterally and surface in the lower areas. The slope can be overcome by installing the absorption fields on the contour and by installing drop boxes or other structures that ensure an even distribution of the liquid waste.

The capability subclass is IIIe.

620A—Darmstadt silt loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on flats and low ridges in the uplands. Individual areas are irregular in shape and range from 3 to 50 acres in size.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsurface layer is grayish brown silt loam about 3 inches thick. The subsoil is about 35 inches thick. The upper part is yellowish brown, mottled, firm silty clay loam; the next part is light brownish gray and gray, mottled, firm and friable silty clay loam; and the lower part is light brownish gray, friable silt loam. The underlying material to a depth of 60 inches is gray, mottled silt loam. In some areas the subsoil contains more clay. In other areas sodium is nearer the surface.

Included with this soil in mapping are small areas of the poorly drained Piasa soils on the lower flats and some areas of Hoyleton and Oconee soils. Hoyleton and Oconee soils occur as areas closely intermingled with areas of the Darmstadt soil. Their surface layer is darker than that of the Darmstadt soil, and their subsoil has a low content of sodium. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Darmstadt soil at a very slow rate. Surface runoff is slow. A perched seasonal high water table is at a depth of 1 to 3 feet from February through May in most years. Available water capacity is moderate. The surface layer typically is neutral because of past liming practices. In some areas, however, it is strongly acid. The subsoil is strongly acid to strongly alkaline. It has a high content of sodium. Organic matter content is moderately low. The surface layer is friable and can be easily tilled when moist. It tends to crust and puddle after hard rains, however, especially in cultivated areas where it contains subsoil material and has a high content of sodium. The shrink-swell potential is moderate in the subsoil.

Most areas are cultivated. This soil is moderately suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

In the areas used for soybeans, corn, or small grain, the wetness delays planting in some years. It can be reduced, however, by a combination of shallow ditches and drainage outlets and by a combination of scattered subsurface drains and surface inlets. The high content of sodium in the subsoil results in moisture stress during dry periods and excess moisture during wet periods. Also, the sodium restricts the availability and uptake of some plant nutrients. Erosion is a hazard in some areas. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Minimizing tillage, returning crop residue to the soil, and regularly adding other organic material increase the rate of water infiltration and improve tilth.

The seasonal wetness and the moderate shrink-swell potential are limitations if this soil is used as a site for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Establishing or maintaining lawns is difficult because of the high content of sodium in the subsoil. Planting salt-tolerant grasses and frequently watering during dry periods improve the lawn.

The seasonal wetness and the very slow permeability are limitations if this soil is used as a septic tank absorption field. Also, the excessive sodium causes the soil to disperse when saturated. The dispersion reduces the absorption rate. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on this soil.

The capability subclass is IIIw.

620B3—Darmstadt silty clay loam, 2 to 5 percent slopes, severely eroded. This gently sloping, somewhat poorly drained soil is on the sides of low ridges and at the head of drainageways in the uplands. Individual areas are irregular in shape and range from 5 to 40 acres in size.

Typically, the surface layer is dark grayish brown silty clay loam about 7 inches thick. The subsoil is firm, mottled silty clay loam about 43 inches thick. The upper part is light brownish gray, the next part is pale brown, and the lower part is light brownish gray. The underlying material to a depth of 60 inches is pale brown, firm silty clay loam. In some areas the surface layer is silt loam. In other areas the lower part of the subsoil and the underlying material are clay loam or silt.

Included with this soil in mapping are small, closely intermingled areas of Hoyleton and Oconee soils. These soils have a surface layer that is darker than that of the Darmstadt soil and have a low content of sodium in the subsoil. They make up 5 to 15 percent of the unit.

Water and air move through the Darmstadt soil at a very slow rate. Surface runoff is medium. A perched seasonal high water table is at a depth of 1 to 3 feet from February through May in most years. Available water capacity is moderate. The surface layer commonly is neutral. The subsoil is mildly alkaline to strongly alkaline. It has a high content of sodium. Organic matter content is low. The surface layer tends to crust and puddle after hard rains. The shrink-swell potential is moderate in the subsoil.

Most areas are used for cultivated crops. This soil is moderately suited to cultivated crops and pasture. It is poorly suited to dwellings and septic tank absorption fields.

In the areas used for soybeans, corn, or small grain, further erosion is a hazard unless the surface is protected. Also, the wetness delays planting in some years. It can be reduced, however, by a combination of shallow ditches and drainage outlets and by scattered subsurface drains. Erosion can be controlled by a system of conservaton tillage that leaves crop residue on the surface after planting and by contour farming. The high content of sodium in the subsoil results in moisture stress during dry periods and excess moisture during wet periods. Also, the sodium restricts the availability and uptake of some plant nutrients. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Minimizing tillage, returning crop residue to the soil, and regularly adding other organic material increase the rate of water infiltration and improve tilth.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of salt-tolerant species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition.

The seasonal wetness and the moderate shrink-swell potential are limitations if this soil is used as a site for dwellings. Installing subsurface drains around the foundation lowers the water table. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Establishing or maintaining lawns is difficult because of the high content of sodium in the subsoil. Planting salt-tolerant grasses and frequently watering during dry periods improve the lawn.

The seasonal wetness and the very slow permeability are limitations if this soil is used as a septic tank absorption field. Also, the excessive sodium causes the soil to disperse when saturated. The dispersion reduces the absorption rate. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIIe.

802—Orthents, loamy. These soils are in areas, mainly on the interchanges of the major highways, where the surface layer and subsoil have been altered by the addition or removal of silt loam, loam, clay loam, or silty clay loam. Individual areas are blocky and range from 5 to 50 acres in size. Slope generally ranges from 0 to 10 percent, but some cutbanks are nearly vertical.

The added soil material generally is mixed but can occur as layers. It is dominantly clay loam or silty clay loam but in some areas is silt loam.

Included with these soils in mapping are water areas and areas of undisturbed soils. The undisturbed soils are on the periphery of the mapped areas or are isolated within them. Included areas make up 10 to 30 percent of the unit.

Water and air commonly move through these soils at a slow rate, but the rate varies because of the diverse nature of the soil material and because of compaction by

construction equipment. Runoff is medium in most areas. Available water capacity generally is high. Organic matter content is low.

These soils are not assigned to a capability class or subclass.

865—Pits, gravel. This map unit consists of excavations from which gravel and some sand have been removed. The pits generally are on oval or oblong ridges of glacial drift and along drainageways cut into these ridges. The ridges are prominently higher than the adjacent areas on the loess-covered till plains. The excavated material is used mainly for roadfill, for concrete or asphalt, or for other construction purposes. Individual areas commonly are 3 to 50 acres in size.

Included with this unit in mapping are some disturbed areas adjacent to the pits.

The excavations commonly are 10 to 40 feet deep. Some are filled with water. The disturbed soil material surrounding the pits has been scraped, mixed, or otherwise altered by mining. It generally is low in organic matter content. Available water capacity varies. Water and air movement through the soil varies because of the diverse soil material and because of compaction by heavy equipment.

Abandoned pits commonly are used for wildlife habitat or recreation areas. Some of those that are filled with water have been stocked with fish. In some of the disturbed areas surrounding the pits, woody and herbaceous plants are established. These areas are suited to wildlife habitat. If the pits are to be used for most other purposes, intensive or drastic reclamation that includes filling or grading is needed. The feasibility of reclamation depends on the conditions at the site and the desired alternative use.

This map unit is not assigned to a capability class or subclass.

912A—Hoyleton-Darmstadt silt loams, 0 to 2 percent slopes. These nearly level, somewhat poorly drained soils are on low ridges in the uplands. Individual areas are irregular in shape and range from 5 to more than 200 acres in size. They are 50 to 60 percent Hoyleton soil and 40 to 50 percent Darmstadt soil. The two soils occur as areas so closely intermingled that mapping them separately is not practical.

Typically, the Hoyleton soil has a surface layer of dark brown silt loam about 9 inches thick. The subsurface layer is brown, friable silt loam about 7 inches thick. The subsoil to a depth of more than 60 inches is mottled, firm silty clay loam. The upper part is pale brown, the next part is brown, and the lower part is light brownish gray. In places the soil does not have a subsurface layer. In some areas the depth to a seasonal high water table is less than 1 foot. In other areas the surface layer is thicker.

Typically, the Darmstadt soil has a surface layer of brown silt loam about 9 inches thick. The subsurface layer is pale brown, friable silt loam about 6 inches thick. The subsoil is mottled, firm silty clay loam about 40 inches thick. The upper part is yellowish brown, the next part is brown, and the lower part is light brownish gray. The underlying material to a depth of 60 inches is light gray, friable silt loam. In some areas the lower part of the subsoil is clay loam. In other areas the depth to a seasonal high water table is less than 1 foot or more than 3 feet. In places the soil does not have a subsurface layer.

Water and air move through the Hoyleton soil at a slow rate and through the Darmstadt soil at a very slow rate. Surface runoff is slow on both soils. A seasonal high water table usually is at a depth of 1 to 3 feet from March through June in the Hoyleton soil and from February through May in the Darmstadt soil. Available water capacity is high in the Hoyleton soil and moderate in the Darmstadt soil. The surface layer of both soils is slightly acid because of past liming practices. The subsoil of the Hoyleton soil is strongly acid. That of the Darmstadt soil is strongly acid to moderately alkaline. It has a high content of sodium. Organic matter content is moderately low in both soils. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is high in the subsoil of the Hoyleton soil and moderate in the subsoil of the Darmstadt soil.

Most areas are cultivated. These soils are moderately suited to cultivated crops. They are poorly suited to dwellings and septic tank absorption fields.

In the areas used for soybeans, corn, or small grain, the wetness delays planting in some years. It can be reduced, however, by a combination of scattered subsurface drains and surface inlets or of shallow ditches and drainage outlets. The high content of sodium in the subsoil of the Darmstadt soil results in moisture stress during dry periods and excess moisture during wet periods. Also, the sodium restricts the availability and uptake of some plant nutrients. Tilling when the soil is wet causes surface compaction, cloddiness, and excessive runoff. Minimizing tillage, returning crop residue to the soil, and adding other organic material increase the rate of water infiltration and improve tilth and fertility.

The seasonal wetness and the high or moderate shrink-swell potential are limitations if these soils are used as sites for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Foundation drains lower the water table. Establishing or maintaining lawns is difficult because of the high content of sodium in the Darmstadt soil. Planting salt-tolerant grasses and frequently watering during dry periods improve the lawn.

The slow or very slow permeability and the seasonal wetness are limitations if these soils are used as septic tank absorption fields. Also, excessive sodium causes

the Darmstadt soil to disperse when saturated. The dispersion reduces the absorption rate. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on these soils.

The capability subclass is IIIw.

912B2—Hoyleton-Darmstadt silt loams, 2 to 5 percent slopes, eroded. These gently sloping, somewhat poorly drained soils are on the sides of ridges and along drainageways in the uplands. Individual areas are irregular in shape and range from 5 to 160 acres in size. They are 50 to 60 percent Hoyleton soil and 40 to 50 percent Darmstadt soil. The two soils occur as areas so closely intermingled that mapping them separately is not practical.

Typically, the Hoyleton soil has a surface layer of dark brown silt loam about 7 inches thick. The subsoil to a depth of more than 60 inches is firm, mottled silty clay loam. The upper part is yellowish brown, and the lower part is light brownish gray. In some areas the surface layer is silty clay loam. In other areas the subsoil contains less clay.

Typically, the Darmstadt soil has a surface layer of brown silt loam about 6 inches thick. The subsoil is firm, mottled silty clay loam about 45 inches thick. The upper part is brown, the next part is light brownish gray, and the lower part is gray. The underlying material to a depth of 60 inches is gray, firm clay loam. In some areas the surface layer is silty clay loam. In other areas the lower part of the subsoil contains sand and pebbles. In places the depth to a seasonal high water table is more than 3 feet.

Water and air move through the Hoyleton soil at a slow rate and through the Darmstadt soil at a very slow rate. Surface runoff is medium on both soils. A seasonal high water table usually is at a depth of 1 to 3 feet from March through June in the Hoyleton soil and from February through May in the Darmstadt soil. Available water capacity is high in the Hoyleton soil and moderate in the Darmstadt soil. The surface layer of both soils is neutral because of past liming practices. The subsoil of the Hoyleton soil is strongly acid. That of the Darmstadt soil is strongly acid to moderately alkaline. It has a high content of sodium. Organic matter content is moderately low in both soils. The surface layer tends to crust and puddle after hard rains, especially in areas of the Darmstadt soil and in cultivated areas where the surface layer contains subsoil material. The shrink-swell potential is high in the subsoil of the Hoyleton soil and moderate in the subsoil of the Darmstadt soil.

Most areas are cultivated. These soils are moderately suited to cultivated crops. They are poorly suited to dwellings and septic tank absorption fields.

In the areas used for soybeans, corn, or small grain, further erosion is a hazard unless the surface is protected. Also, the wetness delays planting in some years. It can be reduced, however, by scattered subsurface drains or by a combination of shallow ditches and drainage outlets. Erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting. The high content of sodium in the subsoil of the Darmstadt soil results in moisture stress during dry periods and excess moisture during wet periods. Also, the sodium restricts the availability and uptake of some plant nutrients. Tilling when the soil is wet causes surface compaction and cloddiness and decreases the rate of water infiltration. Minimizing tillage, returning crop residue to the soil, and adding other organic material increase the infiltration rate and improve tilth and fertility.

A cover of hay or pasture plants improves tilth and helps to control erosion. Applications of fertilizer, weed control, pasture rotation, proper stocking rates, timely harvesting, and timely deferment of grazing help to keep the pasture or hayland in good condition.

The seasonal wetness and the high or moderate shrink-swell potential are limitations if these soils are used as sites for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Foundation drains lower the water table. Establishing or maintaining lawns is difficult because of the high content of sodium in the Darmstadt soil. Planting salt-tolerant grasses and frequently watering during dry periods improve the lawn.

The slow or very slow permeability and the seasonal wetness are limitations if these soils are used as septic tank absorption fields. Also, excessive sodium causes the Darmstadt soil to disperse when saturated. The dispersion reduces the absorption rate. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIIe.

914C3—Atlas-Grantfork silty clay loams, 4 to 10 percent slopes, severely eroded. These moderately sloping, somewhat poorly drained soils are on upland side slopes. Individual areas are long and irregular in shape and range from 5 to 40 acres in size. They are 40 to 60 percent Atlas soil and 30 to 50 percent Grantfork soil. The two soils occur as areas so closely intermingled that mapping them separately is not practical.

Typically, the Atlas soil has a surface layer of yellowish brown silty clay loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled and firm. The upper part is yellowish brown silty clay loam, and the lower part is gray and light gray clay loam. In some areas the subsoil contains more clay.

Typically, the Grantfork soil has a surface layer of dark brown silty clay loam about 3 inches thick. The subsoil is

about 51 inches thick. It is mottled. The upper part is dark yellowish brown and yellowish brown silty clay loam, the next part is grayish brown clay loam, and the lower part is light brownish gray clay loam. The underlying material to a depth of 60 inches is light brownish gray, mottled clay loam. In some areas the content of exchangeable sodium is more than 15 percent in the upper part of the subsoil.

Included with these soils in mapping are small areas of the well drained, steep Hickory soils on side slopes. These included soils make up 5 to 10 percent of the unit.

Water and air move through the Atlas soil at a very slow rate and through the Grantfork soil at a slow rate. Surface runoff is rapid on both soils. A perched seasonal high water table generally is within a depth of 2 feet from April through June in the Atlas soil and is at a depth of 1 to 3 feet from January through May in the Grantfork soil. Available water capacity is moderate in both soils. Reaction in the surface layer commonly is medium acid in the Atlas soil and very strongly acid in the Grantfork soil, but it varies because of local liming practices. The subsoil of the Atlas soil is very strongly acid to mildly alkaline. That of the Grantfork soil is neutral to moderately alkaline. It has a high content of sodium. Organic matter content is low in both soils. The surface layer tends to crust and puddle after hard rains. The shrink-swell potential is high in the subsoil of the Atlas soil.

Most areas are used for cultivated crops or for hay and pasture. Some are used as woodland. These soils generally are unsuited to cultivated crops, mainly because of the hazard of further erosion. They are moderately suited to hay, pasture, and woodland and are poorly suited to dwellings and septic tank absorption fields.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

Erosion is a hazard when trees are planted or harvested in the wooded areas. Also, seedling mortality and the windthrow hazard are moderate on the Atlas soil. Measures that control competing vegetation decrease the seedling mortality rate. A protective plant cover and measures that prevent fires and keep out grazing animals help to control erosion and promote tree growth. Harvesting methods that do not isolate the remaining trees or leave them closely spaced help to prevent windthrow. Timely pruning, thinning, and intermediate cutting improve the woodland.

The seasonal wetness is a limitation if these soils are used as sites for dwellings. The high shrink-swell potential of the Atlas soil and the slope of both soils also are limitations. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Establishing benches by cutting and filling helps to overcome the slope. Compacting the fill improves stability. Extending footings in the fill areas into the undisturbed soil helps to prevent structural damage. Diverting the runoff from upslope areas also helps to prevent this damage. Establishing or maintaining lawns is difficult because of the high content of sodium in the Grantfork soil. Planting salt-tolerant grasses and frequently watering during dry periods improve the lawn.

The seasonal wetness and the slow or very slow permeability are limitations if these soils are used as septic tank absorption fields. Also, excessive sodium causes the Grantfork soil to disperse when saturated. The dispersion reduces the absorption rate. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is VIe.

916A—Oconee-Darmstadt silt loams, 0 to 3 percent slopes. These nearly level, somewhat poorly drained soils are on low, broad ridges in the uplands. Individual areas are irregular in shape and range from 5 to several hundred acres in size. They are 40 to 60 percent Oconee soil and 30 to 50 percent Darmstadt soil. The two soils occur as areas so closely intermingled that mapping them separately is not practical.

Typically, the Oconee soil has a surface layer of very dark grayish brown silt loam about 9 inches thick. The subsurface layer is dark gray silt loam about 6 inches thick. The subsoil extends to a depth of more than 60 inches. It is firm and mottled. The upper part is grayish brown silt loam, and the lower part is grayish brown and brown silty clay loam. In some areas the surface layer is lighter in color. In other areas the soil does not have a subsurface layer. In some places the lower part of the subsoil contains more sand. In other places the depth to a seasonal high water table is less than 1 foot.

Typically, the Darmstadt soil has a surface layer of dark grayish brown silt loam about 6 inches thick. The subsurface layer is grayish brown silt loam about 10 inches thick. The subsoil to a depth of more than 60 inches is mottled silty clay loam. The upper part is brown and firm, the next part is grayish brown and very firm, and the lower part is light brownish gray and firm. In some areas the surface layer is darker. In some places the lower part of the subsoil contains more clay. In other places it contains more sand. In some areas the depth to a seasonal high water table is less than 1 foot, and in other areas it is more than 3 feet.

Included with these soils in mapping are small areas of the well drained Douglas soils on the higher ridges and knolls. These included soils make up 2 to 15 percent of the unit.

Water and air move through the Oconee soil at a slow rate and through the Darmstadt soil at a very slow rate. Surface runoff is slow on both soils. In most years a seasonal high water table is at a depth of 1 to 3 feet from March through June in the Oconee soil and from February through May in the Darmstadt soil. Available water capacity is high in the Oconee soil and moderate in the Darmstadt soil. Reaction in the surface layer of both soils typically is neutral or slightly acid but varies because of local liming practices. The subsoil of the Oconee soil is medium acid to very strongly acid. That of the Darmstadt soil is strongly acid to moderately alklaline. It has a high content of sodium. Organic matter content is moderate in the Oconee soil and moderately low in the Darmstadt soil. The surface layer in both soils is friable and can be easily tilled when moist. It tends to crust and puddle after hard rains, however, especially in areas of Darmstadt soil. The shrink-swell potential is high in the subsoil of the Oconee soil and moderate in the subsoil of the Darmstadt soil.

Most areas are cultivated. These soils are moderately suited to cultivated crops. They are poorly suited to dwellings and septic tank absorption fields.

In the areas used for corn, soybeans, or small grain, the wetness delays planting in some years. It can be reduced, however, by a combination of shallow ditches and drainage outlets and of scattered subsurface drains and surface inlets. The high content of sodium in the subsoil of the Darmstadt soil results in moisture stress during dry periods and excess moisture during wet periods. Also, the sodium restricts the availability and uptake of some plant nutrients. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Minimizing tillage, returning crop residue to the soil, and adding other organic material increase the rate of water infiltration and improve fertility.

The seasonal wetness and the moderate or high shrink-swell potential are limitations if these soils are used as sites for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Establishing or maintaining lawns is difficult because of the high content of sodium in the Darmstadt soil. Planting salt-tolerant grasses and frequently watering during dry periods improve the lawn.

The seasonal wetness and the very slow or slow permeability are limitations if these soils are used as septic tank absorption fields. Also, excessive sodium causes the Darmstadt soil to disperse when saturated. The dispersion reduces the absorption rate. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on these soils.

The capability subclass is IIIw.

916B2—Oconee-Darmstadt silt loams, 2 to 5 percent slopes, eroded. These gently sloping, somewhat poorly drained soils are on the sides of ridges and along drainageways in the uplands. Individual areas are irregular in shape and range from 5 to 100 acres in size. They are 40 to 60 percent Oconee soil and 30 to 50 percent Darmstadt soil. The two soils occur as areas so closely intermingled that mapping them separately is not practical.

Typically, the Oconee soil has a surface layer of very dark grayish brown silt loam about 7 inches thick. The subsoil is mottled, firm and very firm silty clay loam about 45 inches thick. The upper part is dark grayish brown and brown, and the lower part is grayish brown and light brownish gray. The underlying material to a depth of 60 inches is yellowish brown, mottled, firm silt loam. In some areas the surface layer is silty clay loam. In other areas the lower part of the subsoil contains more sand.

Typically, the Darmstadt soil has a surface layer of dark brown silt loam about 7 inches thick. The subsoil is about 32 inches thick. It is mottled and firm. The upper part is pale brown, yellowish brown, and dark yellowish brown silty clay loam, and the lower part is pale brown silt loam. The underlying material to a depth of 60 inches is brown and yellowish brown, firm and friable silt loam and loam. In some areas the surface layer contains more clay because it has been mixed with the upper part of the subsoil by plowing. In other areas the lower part of the subsoil contains more sand. In places the depth to a seasonal high water table is more than 3 feet.

Included with these soils in mapping are small areas of Grantfork soils on the steeper side slopes. These included soils make up 2 to 15 percent of the unit.

Water and air move through the Oconee soil at a slow rate and through the Darmstadt soil at a very slow rate. Surface runoff is medium on both soils. In most years a seasonal high water table is at a depth of 1 to 3 feet from March through June in the Oconee soil and from February through May in the Darmstadt soil. Available water capacity is high in the Oconee soil and moderate in the Darmstadt soil. The subsoil of the Oconee soil is slightly acid or neutral. That of the Darmstadt soil is strongly acid to mildly alkaline. It has a high content of sodium. Organic matter content is moderately low in the Oconee soil and low in the Darmstadt soil. The surface layer in both soils is friable. It tends to crust and puddle after hard rains, however, especially in areas of the Darmstadt soil and in areas where subsoil material is mixed with the surface layer. The shrink-swell potential is high in the subsoil of the Oconee soil and moderate in the subsoil of the Darmstadt soil.

Most areas are cultivated. These soils are moderately suited to cultivated crops. They are poorly suited to dwellings and septic tank absorption fields.

In the areas used for soybeans, corn, or small grain, further erosion is a hazard unless the surface is

protected. Also, the wetness delays planting in some years. It can be reduced, however, by scattered subsurface drains or by shallow ditches and drainage outlets. A system of conservation tillage that leaves crop residue on the surface after planting helps to control erosion. The high content of sodium in the subsoil of the Darmstadt soil results in moisture stress during dry periods and excess moisture during wet periods. Also, the sodium restricts the availability and uptake of some plant nutrients. Tilling when the soil is wet causes surface compaction and cloddiness and decreases the rate of water infiltration. Minimizing tillage, returning crop residue to the soil, and adding other organic material increase the infiltration rate and improve tilth and fertility.

The seasonal wetness and the moderate or high shrink-swell potential are limitations if these soils are used as sites for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Establishing or maintaining lawns is difficult because of the high content of sodium in the Darmstadt soil. Planting salt-tolerant grasses and frequently watering during dry periods improve the lawn.

The seasonal wetness and the very slow or slow permeability are limitations if these soils are used as septic tank absorption fields. Also, excessive sodium causes the Darmstadt soil to disperse when saturated. The dispersion reduces the absorption rate. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is IIIe.

941—Virden-Piasa silt loams. These nearly level, poorly drained soils are on broad flats and in drainageways on uplands. The Virden soil is subject to ponding for brief periods in the spring. Individual areas are irregular in shape and range from 10 to 300 acres in size. They are 50 to 60 percent Virden soil and 40 to 50 percent Piasa soil. The two soils occur as areas so closely intermingled that mapping them separately is not practical.

Typically, the Virden soil has a surface layer of very dark gray silt loam about 9 inches thick. The subsurface layer is very dark gray, friable silt loam about 7 inches thick. The subsoil to a depth of more than 60 inches is mottled, firm silty clay loam. The upper part is dark gray, and the lower part is light brownish gray. In some areas the subsoil contains less clay. In other areas, the subsurface layer is light colored and the surface layer is thinner. In places the depth to a seasonal high water table is more than 2 feet.

Typically, the Piasa soil has a surface layer of very dark grayish brown silt loam about 9 inches thick. The subsurface layer is very dark grayish brown, friable silt loam about 5 inches thick. The subsoil to a depth of more than 60 inches is mottled, firm and very firm silty clay loam. The upper part is dark gray and very dark gray, the next part is dark grayish brown and very dark grayish brown, and the lower part is grayish brown. In some areas the surface layer is lighter in color. In other areas the depth to a seasonal high water table is more than 2 feet.

Water and air move through the Virden soil at a moderately slow rate and through the Piasa soil at a very slow rate. Surface runoff is slow or ponded on both soils. In most years a seasonal high water table is 0.5 foot above to 2.0 feet below the surface of the Virden soil from March through June and is within a depth of 2.0 feet in the Piasa soil from February through May. Available water capacity is high in the Virden soil and moderate in the Piasa soil. The subsoil of the Virden soil is neutral or slightly acid. That of the Piasa soil is neutral to moderately alkaline. It has a high content of sodium. Organic matter content is high in the Virden soil and moderate in the Piasa soil. The surface layer of both soils is friable and can be easily tilled when moist. That of the Piasa soil, however, tends to crust and puddle after hard rains. The shrink-swell potential is high in the subsoil of both soils.

Most areas are used for cultivated crops. Some are used for hay and pasture. These soils are moderately suited to cultivated crops and to hay and pasture. They are poorly suited to dwellings and septic tank absorption fields.

In the areas used for soybeans, corn, or small grain, the wetness of both soils and the high content of sodium in the Piasa soil are limitations. Also, soil blowing is a hazard. The sodium in the subsoil of the Piasa soil results in moisture stress during dry periods and excess moisture during wet periods. Also, it restricts the availability and uptake of some plant nutrients. The wetness can be reduced by a combination of scattered subsurface drains and surface inlets or of shallow ditches and drainage outlets. Leaving crop residue on the surface and establishing field windbreaks help to control soil blowing. Tilling when the soil is wet causes surface compaction and cloddiness and decreases the rate of water infiltration. Minimizing tillage, returning crop residue to the soil, and adding other organic material increase the infiltration rate and improve tilth and fertility.

A cover of pasture plants or hay maintains or improves tilth and helps to control soil blowing. Applications of fertilizer, weed control, pasture rotation, proper stocking rates, timely harvesting, and timely deferment of grazing help to keep the pasture or hayland in good condition.

The seasonal wetness and the high shrink-swell potential are limitations if these soils are used as sites for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers

the water table. Establishing or maintaining lawns is difficult because of the high content of sodium in the Piasa soil. Planting salt-tolerant grasses and frequently watering during dry periods improve the lawn.

The seasonal wetness and the very slow or moderately slow permeability are limitations if these soils are used as septic tank absorption fields. Also, excessive sodium causes the Piasa soil to disperse when saturated. The dispersion reduces the absorption rate. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on the Piasa soil.

The capability subclass is IIIw.

946D3—Hickory-Atlas complex, 10 to 15 percent slopes, severely eroded. These strongly sloping soils are on side slopes in the uplands. The Hickory soil is well drained and the Atlas soil somewhat poorly drained. Individual areas are irregularly shaped or long and narrow and are 3 to 35 acres in size. They are 40 to 60 percent Hickory soil and 30 to 50 percent Atlas soil. The two soils occur as areas so closely intermingled or so small that mapping them separately is not practical.

Typically, the Hickory soil has a surface layer of yellowish brown, friable clay loam about 6 inches thick. The subsoil is firm clay loam about 29 inches thick. The upper part is dark yellowish brown, the next part is yellowish brown, and the lower part is pale brown. The underlying material to a depth of 60 inches is light yellowish brown loam. In some areas the subsoil contains more clay.

Typically, the Atlas soil has a surface layer of brown, friable silty clay loam about 6 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled. The upper part is brown, firm silty clay and clay; the next part is gray, very firm clay; and the lower part is gray, firm clay loam. In some areas the subsoil contains more sand and less clay.

Included with these soils in mapping are small areas of the somewhat poorly drained Grantfork and Wakeland soils. Grantfork soils have a high content of sodium in the subsoil. They are in positions on the landscape similar to those of the Atlas soil. Wakeland soils are in very narrow drainageways below the Hickory soil and are occasionally flooded. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Hickory soil at a moderate rate and through the Atlas soil at a very slow rate. Surface runoff is rapid on both soils. A perched seasonal high water table is within a depth of 2 feet in the Atlas soil from April through June in most years. Available water capacity is high in the Hickory soil and moderate in the Atlas soil. The surface layer of both soils is strongly acid. The subsoil is medium acid to very strongly acid. Organic matter content is low. The surface layer tends to crust after heavy rains. The shrink-swell potential is moderate in the Hickory soil and high in the Atlas soil.

Most areas are used for cultivated crops or for pasture. Because of a hazard of further erosion, these soils generally are unsuited to cultivated crops. They are moderately suited to pasture and woodland. The Hickory soil is moderately suited and the Atlas soil poorly suited to dwellings and septic tank absorption fields.

A cover of grasses and legumes improves tilth and helps to control erosion. Selection of suitable species for planting, proper stocking rates, pasture rotation, timely deferment of grazing, and applications of fertilizer help to keep the pasture and the soil in good condition.

Erosion control is needed if these soils are used as woodland, especially during periods when seedlings are established. Critical area treatment helps to establish a plant cover on the site before the trees are planted. Harvesting methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Seedlings survive and grow well if competing vegetation is controlled and an adequate fertility level is maintained. Measures that prevent fires and keep out grazing animals help to control erosion and promote tree growth. Timely pruning, thinning, and intermediate cutting improve the woodland.

The seasonal wetness and high shrink-swell potential of the Atlas soil and the slope and moderate shrink-swell potential of the Hickory soil are limitations if these soils are used as sites for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Diverting the runoff from upslope areas also helps to prevent structural damage. Installing subsurface drains around the footings lowers the water table. Cutting and filling help to overcome the slope.

The seasonal wetness and very slow permeability of the Atlas soil and the moderate permeability of the Hickory soil are limitations if these soils are used as septic tank absorption fields. The slope also is a limitation. A septic tank system can function satisfactorily only if a sealed sand filter and disinfection tank or an evapotranspiration bed are installed and the distribution lines are installed on the contour. Sewage lagoons function satisfactorily only if the site is leveled.

The capability subclass is VIe.

967F—Hickory-Gosport complex, 15 to 30 percent slopes. These steep soils are on side slopes in the uplands. The well drained Hickory soil is higher on the landscape than the moderately well drained Gosport soil. Individual areas are long and narrow and range from 10 to 150 acres in size. They are 50 to 70 percent Hickory soil and 20 to 40 percent Gosport soil. The two soils occur as areas so closely intermingled that mapping them separately is not practical.

Typically, the Hickory soil has a surface layer of dark brown loam about 4 inches thick. The subsurface layer is

brown loam about 8 inches thick. The subsoil is about 42 inches thick. The upper part is brown loam; the next part is strong brown, firm clay loam; and the lower part is yellowish brown, firm clay loam. The underlying material to a depth of 60 inches is yellowish brown, firm loam. In some areas the lower part of the subsoil formed in material weathered from shale and siltstone. In other areas, the soil is eroded and the surface layer is silty clay loam.

Typically, the Gosport soil has a surface layer of very dark grayish brown silt loam about 5 inches thick. The subsoil is firm and very firm silty clay about 29 inches thick. The upper part is yellowish brown, the next part is yellowish brown and mottled, and the lower part is grayish brown and mottled. Extremely firm clay shale is at a depth of about 34 inches. In some areas the surface layer contains more sand. In other areas, the soil is eroded and the surface layer contains more clay.

Included with these soils in mapping are areas of the somewhat poorly drained Atlas, Marine, and Wakeland soils. Atlas soils are at the head of drainageways. Marine soils are on ridgetops above the Hickory soil. Wakeland soils are on narrow bottom land below the Gosport soil. Included soils make up 5 to 15 percent of the unit.

Water and air move through the Hickory soil at a moderate rate and through the Gosport soil at a very slow rate. Surface runoff is rapid on both soils. Available water capacity is high in the Hickory soil and low in the Gosport soil. The surface layer in both soils commonly is slightly acid or medium acid. The subsoil of the Hickory soil is slightly acid to strongly acid, and that of the Gosport soil is extremely acid. Organic matter content is moderately low in both soils. The shrink-swell potential is moderate in the subsoil of the Hickory soil and high in the subsoil of the Gosport soil.

Most areas are used as woodland. These soils are moderately suited to woodland and well suited to woodland wildlife habitat. They are unsuited to cultivated crops and to dwellings and septic tank absorption fields because of the slope of both soils and the moderate depth to bedrock in the Gosport soil.

Erosion control is needed when trees are planted or harvested in the wooded areas. Also, the steep slope moderately restricts the use of equipment, and seedling mortality and the windthrow hazard are severe on the Gosport soil. Harvesting methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Seedlings survive and grow well if competing vegetation is controlled and an adequate fertility level is maintained. A protective plant cover and measures that prevent fires and keep out grazing animals help to control erosion and promote tree growth. Timely pruning, thinning, and intermediate cutting improve the woodland.

In areas used as habitat for woodland wildlife, adequate stands of herbaceous plants can be maintained. Because of the steep slope and low fertility, however, adequate stands of grain and seed crops cannot be established. Measures that prevent fires and keep out grazing animals are needed.

The capability subclass is VIIe.

991—Cisne-Huey silt loams. These nearly level, poorly drained soils are on broad upland plains. Individual areas are irregular in shape and range from 5 to more than 200 acres in size. They are 50 to 60 percent Cisne soil and 40 to 50 percent Huey soil. The two soils occur as areas so closely intermingled that mapping them separately is not practical.

Typically, the Cisne soil has a surface layer of very dark grayish brown silt loam about 9 inches thick. The subsurface layer is grayish brown silt loam about 12 inches thick. The subsoil is about 29 inches thick. It is firm and mottled. The upper part is light brownish gray silty clay loam, the next part is light brownish gray silty clay, and the lower part is light gray silty clay loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, firm clay loam. In some areas, the subsurface layer is thinner and the upper part of the subsoil contains less clay. In other areas the depth to a seasonal high water table is more than 2 feet.

Typically, the Huey soil has a surface layer of dark grayish brown silt loam about 6 inches thick. The subsurface layer is grayish brown silt loam about 1 inch thick. The subsoil is mottled, firm silty clay loam about 30 inches thick. The upper part is light brownish gray, the next part is grayish brown, and the lower part is gray. The underlying material to a depth of 60 inches is gray, friable silt loam. The content of sand is about 10 percent below a depth of 50 inches. In some areas the depth to a seasonal high water table is more than 2 feet.

Water and air move through these soils at a very slow rate. Surface runoff is slow. In most years a perched seasonal high water table is within a depth of 2 feet from February through June in the Cisne soil and from March through June in the Huey soil. Available water capacity is high in the Cisne soil and moderate in the Huey soil. The surface layer of both soils is neutral because of past liming practices. The subsoil of the Cisne soil is slightly acid to very strongly acid. That of the Huey soil is medium acid to moderately alkaline. It has a high content of sodium below a depth of about 10 inches. Organic matter content is moderately low in both soils. The surface layer is friable and can be easily tilled when moist. The shrink-swell potential is high in the subsoil of the Cisne soil and moderate in the subsoil of the Huey soil.

Most areas are used for cultivated crops. Some are used for pasture and hay. These soils are poorly suited to cultivated crops and moderately suited to pasture and hay. They are poorly suited to dwellings and septic tank absorption fields.

In the areas used for soybeans, corn, or small grain, the wetness of both soils and the high content of sodium

in the Huey soil are limitations. Also, soil blowing is a hazard. The sodium in the subsoil of the Huey soil results in moisture stress during dry periods and excess moisture during wet periods. Also, it restricts the availability and uptake of some plant nutrients. A combination of scattered subsurface drains and surface inlets or of shallow ditches and drainage outlets reduces the wetness. Leaving crop residue on the surface and establishing field windbreaks help to control soil blowing. Tilling when the soil is wet causes surface compaction and cloddiness and decreases the rate of water infiltration. Minimizing tillage, returning crop residue to the soil, and adding other organic material increase the infiltration rate and improve tilth and fertility.

A cover of pasture plants or hay maintains or improves tilth and helps to control soil blowing. Applications of fertilizer, weed control, pasture rotation, proper stocking rates, timely harvesting, and timely deferment of grazing help to keep the pasture or hayland in good condition.

The seasonal wetness and the high or moderate shrink-swell potential are limitations if these soils are used as sites for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Establishing or maintaining lawns is difficult because of the high content of sodium in the Huey soil. Planting salt-tolerant grasses and frequently watering during dry periods improve the lawn.

The seasonal wetness and the very slow permeability are limitations if these soils are used as septic tank absorption fields. Also, excessive sodium causes the Huey soil to disperse when saturated. The dispersion reduces the absorption rate. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on these soils.

The capability subclass is IVw.

993—Cowden-Piasa silt loams. These nearly level, poorly drained soils are on broad till plains. Individual areas are irregular in shape and range from 15 to more than 200 acres in size. They are 40 to 60 percent Cowden soil and 40 to 60 percent Piasa soil. The two soils occur as areas so closely intermingled that mapping them separately is not practical.

Typically, the Cowden soil has a surface layer of very dark grayish brown silt loam about 8 inches thick. The subsurface layer is dark gray and gray silt loam about 8 inches thick. The subsoil is mottled, firm silty clay loam about 39 inches thick. The upper part is dark grayish brown, the next part is grayish brown, and the lower part is gray. The underlying material to a depth of 60 inches is mottled light brownish gray and very dark grayish brown silt loam and black silty clay loam. In some areas the surface layer is lighter in color. In other areas it is thicker. In some places the underlying material contains more sand. In other places the depth to a seasonal high water table is more than 2 feet.

Typically, the Piasa soil has a surface layer of very dark gray silt loam about 8 inches thick. The subsurface layer is grayish brown silt loam about 3 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled and firm. The upper part is very dark gray silty clay loam, the next part is gray silty clay loam and silty clay, and the lower part is light brownish gray silty clay loam. In some areas the surface layer is thinner and lighter in color. In other areas the soil has no subsurface layer. In some places the subsoil contains less clay. In other places the depth to a seasonal high water table is more than 2 feet.

Included with these soils in mapping are small areas of the well drained Douglas soils on prominent ridges. These included soils make up 2 to 5 percent of the unit.

Water and air move through the Cowden soil at a slow rate and through the Piasa soil at a very slow rate. Surface runoff is slow on both soils. In most years a seasonal high water table is within a depth of 2 feet from March through June in the Cowden soil and from February through May in the Piasa soil. Available water capacity is high in the Cowden soil and moderate in the Piasa soil. Reaction in the surface layer of both soils is slightly acid but varies because of local liming practices. The subsoil of the Cowden soil is strongly acid to neutral. That of the Piasa soil is neutral to moderately alkaline. It has a high content of sodium. Organic matter content is moderate in both soils. The surface layer is friable and can be easily tilled when moist. It tends to crust and puddle after hard rains, however, especially in areas of the Piasa soil. The shrink-swell potential is high in the subsoil of both soils.

Most areas are used for cultivated crops. Some are used for hay and pasture. These soils are moderately suited to cultivated crops and well suited to hay and pasture. They are poorly suited to dwellings and septic tank absorption fields.

In the areas used for soybeans, corn, or small grain, the wetness of both soils and the high content of sodium in the Piasa soil are limitations. Also, soil blowing is a hazard. The sodium in the subsoil of the Piasa soil results in moisture stress during dry periods and excess moisture during wet periods. Also, it restricts the availability and uptake of some plant nutrients. A combination of subsurface drains and surface inlets or of shallow ditches and drainage outlets reduces the wetness. Leaving crop residue on the surface and establishing field windbreaks help to control soil blowing. Tilling when the soil is wet causes surface compaction and cloddiness and decreases the rate of water infiltration. Minimizing tillage, returning crop residue to the soil, and adding other organic material increase the infiltration rate and improve tilth and fertility.

A cover of pasture plants or hay improves tilth and helps to control soil blowing. Applications of fertilizer, weed control, pasture rotation, proper stocking rates, timely harvesting, and timely deferment of grazing help to keep the pasture or hayland in good condition.

The seasonal wetness and the high shrink-swell potential are limitations if these soils are used as sites for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Establishing or maintaining lawns is difficult because of the high content of sodium in the Piasa soil. Planting salt-tolerant grasses and frequently watering during dry periods improve the lawn.

The seasonal wetness and the slow or very slow permeability are limitations if these soils are used as septic tank absorption fields. Also, excessive sodium causes the Piasa soil to disperse when saturated. The dispersion reduces the absorption rate. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an evapotranspiration bed are installed. Sewage lagoons function very well on these soils.

The capability subclass is IIIw.

995—Herrick-Piasa silt loams. These nearly level soils are on broad flats and in depressions on uplands. The Herrick soil is somewhat poorly drained and the Piasa soil poorly drained. Individual areas are irregular in shape and range from 15 to more than 200 acres in size. They are 30 to 60 percent Herrick soil and 30 to 60 percent Piasa soil. The two soils occur as areas so closely intermingled that mapping them separately is not practical.

Typically, the Herrick soil has a surface layer of very dark grayish brown silt loam about 12 inches thick. The subsurface layer is dark grayish brown, friable silt loam about 3 inches thick. The subsoil is mottled silty clay loam about 41 inches thick. The upper part is brown and firm, the next part is brown and very firm, and the lower part is light gray and very firm. The underlying material to a depth of 60 inches is light gray, firm silt loam. In some areas the subsoil contains less clay. In other areas the surface layer is thinner. In some places the soil has no subsurface layer. In other places the depth to a seasonal high water table is less than 1 foot.

Typically, the Piasa soil has a surface layer of very dark grayish brown and dark brown silt loam about 11 inches thick. The subsurface layer is dark grayish brown, friable silt loam about 4 inches thick. The subsoil to a depth of more than 60 inches is grayish brown, mottled, firm silty clay loam. In some areas the soil has no subsurface layer. In other areas the surface layer is lighter in color. In places the depth to a seasonal high water table is more than 2 feet.

Included with these soils in mapping are small areas of the well drained Douglas soils on prominent ridges. These included soils make up 2 to 15 percent of the unit.

Water and air move through the Herrick soil at a moderately slow rate and through Piasa soil at a very slow rate. Surface runoff is slow on both soils. In most years a seasonal high water table is at a depth of 1 to 3 feet from March through June in the Herrick soil and is within a depth of 2 feet from February through May in the Piasa soil. Available water capacity is high in the Herrick soil and moderate in the Piasa soil. Reaction in the surface layer of both soils commonly is slightly acid but varies because of local liming practices. The subsoil of the Herrick soil is slightly acid. That of the Piasa soil is mildly alkaline to strongly alkaline. It has a high content of sodium. Organic matter content is moderate in both soils. The surface layer is friable and can be easily tilled when moist. It tends to crust and puddle after hard rains, however, especially in areas of the Piasa soil. The shrink-swell potential is high in the subsoil of both soils.

Most areas are cultivated. These soils are moderately suited to cultivated crops. They are poorly suited to dwellings and septic tank absorption fields.

In the areas used for soybeans, corn, or small grain, the wetness and high content of sodium in the Piasa soil are limitations. Also, soil blowing is a hazard. The sodium in the subsoil of the Piasa soil results in moisture stress during dry periods and excess moisture during wet periods. Also, it restricts the availability and uptake of some plant nutrients. A combination of subsurface drains and surface inlets or of shallow ditches and drainage outlets reduces the wetness. Leaving crop residue on the surface and establishing field windbreaks help to control soil blowing. Tilling when the soil is wet causes surface compaction and cloddiness and decreases the rate of water infiltration. Minimizing tillage, returning crop residue to the soil, and adding other organic material increase the infiltration rate and improve tilth and fertility.

The seasonal wetness and the high shrink-swell potential are limitations if these soils are used as sites for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Establishing or maintaining lawns is difficult because of the high content of sodium in the Piasa soil. Planting salt-tolerant grasses and frequently watering during dry periods improve the lawn.

The seasonal wetness and the moderately slow or very slow permeability are limitations if these soils are used as septic tank absorption fields. Also, excessive sodium causes the Piasa soil to disperse when saturated. The dispersion reduces the absorption rate. A septic tank system can function satisfactorily only if a sealed sand filter and a disinfection tank or an

evapotranspiration bed are installed. Sewage lagoons function well on the Piasa soil.

The capability subclass is IIIw.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in providing the Nation's short- and long-range needs for food and fiber. Because the supply of high quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cropland, pasture, woodland, or other land, but it is not urban and built-up land or water areas. It either is used for food or fiber or is available for those uses. The soil qualities, growing season, and moisture supply are those needed for a well managed soil economically to produce a sustained high yield of crops. Prime farmland produces the highest yields with minimum inputs of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland usually has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 5 percent. More detailed information about the criteria for prime farmland is available at the local office of the Soil Conservation Service.

About 107,000 acres in Bond County, or nearly 44 percent of the total acreage, meets the requirements for prime farmland. Associations 1, 2, 4, and 6, which are described under the heading "General Soil Map Units," have the highest percentage, but the prime farmland is throughout the county. About 100,000 acres of the prime farmland is used for crops, mainly corn and soybeans, which account for most of the local agricultural income each year.

A recent trend in land use in some parts of the county has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in Bond County that meet the requirements for prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Some map units meet the requirements for prime farmland only in areas where the soil is drained or is not frequently flooded during the growing season (fig. 12). Onsite evaluation is needed to determine whether or not a specific area of the soil can be considered prime farmland. In Bond County the naturally wet soils generally have been adequately drained.

Figure 12.—An area of Birds soils on wide bottom land that meets the requirements for prime farmland where it is not frequently flooded during the growing season. The Hickory soils on the side slopes in the background are not considered prime farmland because they are too steep.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

An estimated 163,563 acres in Bond County was cropland in 1978. This included 81,568 acres of soybeans, 35,083 acres of corn, and 19,844 acres of wheat. Also included were 11,223 acres of pasture, 9,716 acres of hay, 3,438 acres of grain sorghum, and 116 acres of land in orchards (*16*).

The acreage used for soybeans and wheat has increased in recent years because a rotation of wheat double cropped with soybeans has become popular. This rotation allows the harvesting of two cash crops each year. The acreage used for corn has decreased slightly. The acreage used for sorghum has increased markedly. Bond County ranks fourth in the state in sorghum production. The sorghum is used mainly as livestock feed. Important fruit crops in the county are apples and peaches (fig. 13).

The demand for food and fiber has increased in recent years. As a result, some marginal land has been used for crops. Much of this marginal land is more erosive than the more productive land. Another recent trend is an increase in the number of small residential tracts throughout the county. These tracts commonly are on prime farmland. If these trends continue, they could result in a significant decline in the quality and quantity of the land used for food and fiber.

The concerns in managing the cropland in the county are erosion, soil blowing, wetness, fertility, tilth, and limited soil moisture.

Erosion is a major management concern. On the cropland where erosion exceeds soil-loss tolerance limits, the average annual loss is 12.7 tons per acre per year (*12*). Most of this excessive erosion occurs on about 39 percent of the cropland. Soils that have a slope of 2 percent or more are susceptible to excessive erosion. Some soils are so eroded that little or no surface soil remains. Atlas silty clay loam, 5 to 10 percent slopes, severely eroded, is an example.

Erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into a plow layer. Valuable nutrients are lost and tilth deteriorates as the more

Figure 13.—An apple orchard in an area of Pike soils.

clayey subsoil is mixed with the plow layer. Erosion is especially damaging on soils that have a clayey or unfavorable subsoil or have a root-restricting layer near the surface. Cisne, Cowden, and Marine, and Rushville are examples of soils that have a clayey subsoil. Darmstadt, Grantfork, Huey, and Tamalco soils have an unfavorable subsoil that is high in content of exchangeable sodium. Ava and Hosmer soils have an unfavorable subsoil that is so firm and brittle that it cannot be penetrated by roots. Gosport soils are underlain by root-restricting shale bedrock. The second damaging effect of erosion is the pollution that occurs when the sediment and nutrients from eroding farmland enter streams. Erosion control helps to prevent the pollution of streams by sediment and improves the quality of water for municipal use, recreation, and fish and other wildlife.

Conservation practices provide a protective plant cover, increase the rate of water infiltration, reduce the runoff rate, and help to control erosion. Following are some of the conservation practices that are suitable on the cropland in Bond County. In many areas a combination of these practices is needed to control erosion. The combination needed depends on the soil characteristics and the topography.

A conservation cropping system that keeps a plant cover on the surface for extended periods can hold soil loss to an amount that will not reduce the productive capacity of the soil. It is a combination of a cropping sequence and the needed cultural and management measures. Grasses and legumes commonly are included in the cropping sequence. A protective cover of these plants reduces the runoff rate, helps to control erosion, provides nitrogen, and improves tilth for the following

crop. The grasses and legumes also provide feed for livestock or can be sold for cash.

Terraces are most effective in controlling erosion on the more sloping soils. They help to control erosion by intercepting surface runoff and conducting it to a stable outlet at a nonerosive velocity. They are a series of embankments or of ridges and channels that are properly spaced and have a proper grade. Outlets may be grassed waterways or tile outlets. There are several different types of terraces. If various types and designs are used, most of the more sloping soils in the county can be terraced. In areas of Darmstadt, Tamalco, and other soils that have a high content of sodium in the subsoil, the depth to sodium adversely affects the suitability for terraces because the subsoil is more erosive and less productive than the overlying layer. Atlas, Negley, and other soils in areas where the topography is irregular and slopes commonly are short and steep are not suitable for terracing. Conversion to other uses, such as pasture, hay, or woodland, is desirable to control erosion on these soils.

Grassed waterways in drainageways safely dispose of surface runoff. They help to prevent gully erosion and provide outlets for terraces. Other conservation practices are contour farming and conservation tillage. Contour farming is planting and tilling on the contour of the land. It is most effective in areas where the slope is 7 percent or less. It commonly is used in combination with terraces. Conservation tillage is a system of noninversion tillage that retains protective amounts of crop residue on the surface throughout the year (fig. 14). It helps to control erosion, maintains or promotes good soil structure, helps to prevent compaction and the formation of tillage pans, and improves aeration, infiltration, and tilth. It includes no-tillage, strip tillage, stubble mulching, and other types of noninversion tillage.

Information about the design of conservation practices is available at the office of the Bond County Soil and Water Conservation District.

Most of the nearly level soils in the county are susceptible to soil blowing. A plant cover, surface mulch, and tillage methods that leave the surface rough help to control blowing. Windbreaks also are effective in controlling soil blowing.

Drainage is needed on much of the farmland in the county. Unless the very poorly drained to somewhat poorly drained soils are artificially drained, the wetness can damage crops or delay planting in most years. About

Figure 14.—A chiseled soybean field that has plant residue on the surface. The plant residue helps to control erosion and soil blowing.

30 percent of the farmland occurs as poorly drained or very poorly drained soils. These include Beaucoup and Birds soils on bottom land and Cisne, Cowden, Piasa, Rushville, Virden, and Wynoose soils on uplands. About 58 percent of the farmland occurs as somewhat poorly drained soils. The most extensive of these are the Bluford, Darmstadt, Hoyleton, Marine, and Stoy soils on uplands. The Wakeland soils on bottom land also are somewhat poorly drained.

The design of drainage systems differs from soil to soil. Tile lines function well on bottom land soils if suitable outlets are available. Surface ditches are needed in some areas of these soils. Also, measures that control flooding are needed in areas that are subject to damaging overflow during the growing season. Standard tile lines do not function well in upland soils that are slowly permeable or very slowly permeable. Surface ditches or a combination of scattered tile lines and surface inlets is needed in these soils. In some areas land leveling is needed to smooth out depressions.

Natural fertility is low in soils that have a high content of sodium in the subsoil. Excessive amounts of sodium in Darmstadt, Huey, Tamalco, and other soils restrict the availability and uptake of some plant nutrients. Applications of gypsum improve fertility because they result in the removal of some of the excess sodium over a period of years. Returning crop residue to the soil and regularly adding manure and other organic material also improve fertility.

Natural fertility is high in Herrick, Lawson, Tice, and other soils that have a thick, dark surface layer. These soils formed under or were influenced by prairie grasses. They have a deep root zone and a high or very high available water capacity. Plants on these soils respond well to applications of fertilizer and lime.

Natural fertility is medium in Ava, Bluford, Rushville, Stoy, Wynoose, and other soils that formed under forest vegetation and have a light colored surface layer. Reaction in these soils ranges from extremely acid to strongly acid. Applications of limestone are needed to raise the pH level. The supply of available phosphorus and potash is low in some of the soils. Soil tests are needed to determine the proper amounts of lime and fertilizer needed. Assistance in determining the proper kinds or amounts of fertilizer and lime is available at the local office of the Cooperative Extension Service.

Tilth has an important effect on seed germination and water infiltration. It is good in soils that are granular and porous and is best in soils having a silt loam surface layer that has a high content of organic matter and granular structure. Cowden, Herrick, Huntsville, Lawson, Oconee, and Virden are examples of soils in which tilth is good.

Soils that have a low content of organic matter or a high content of sodium have weak structure in the surface layer. Examples are Ava, Hosmer, Negley, Rushville, Tamalco, and Wynoose soils. During periods of hard rainfall, a crust forms at the surface of these soils. This crust is hard when dry. As a result, the rate of water infiltration is decreased and runoff and erosion are excessive. Returning crop residue to the soil and adding manure or other organic material improve tilth in these soils.

Tilth deteriorates as a result of erosion. As part of the subsoil is incorporated into a plow layer in eroded soils, the plow layer becomes more clayey. As a result, the rate of water infiltration is decreased and the runoff rate and the susceptibility to erosion are increased. These soils are sticky when wet and hard and cloddy when dry. Examples are Atlas, Darmstadt, Grantfork, and Negley soils. A conservation cropping system dominated by hay and pasture improves tilth in these soils.

The need for an adequate amount of soil moisture during dry years is a concern in soils that have an unfavorable or root-restricting subsoil. These soils have a moderate or low available water capacity. Examples are Atlas, Ava, Gosport, Hosmer, and Tamalco soils.

About 20,000 acres in the county is used as hayland or pasture. If properly managed, the hayland or pasture can be productive and erosion can be kept to a minimum. Selection of suitable species for planting, applications of fertilizer, proper stocking rates, and rotation grazing help to keep the stand productive. Overgrazing or grazing when the soil is wet reduces productivity and causes surface compaction and excessive runoff and erosion. Assistance in managing specific tracts is available from the local office of the Soil Conservation Service.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents (*3*). Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that insures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely

to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management (*14*). The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in table 6.

Woodland Management and Productivity

Most of Bond County was originally covered by hardwoods of good quality (*5*). Only about 35,700 acres of woodland is left in the county. A limited part of this acreage is managed as commercial woodland. Christmas trees are grown in a few areas (fig. 15). Markets for trees are available in the county. Important trees are silver maple, ash, and sycamore on bottom land and white oak, red oak, black walnut, and shagbark hickory on uplands.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: x, w, t, d, c, s, f, and r.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or

Figure 15.—A Christmas tree farm on Hosmer and Stoy soils.

special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that few trees may be blown down by strong winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and

codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To insure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 8 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 8 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service or the Cooperative Extension Service or from a nursery.

Recreation

The acreage in Bond County used for recreation has increased in recent years. Parks have been developed for multiple recreation uses. Privately owned camping areas also have been developed. Part of the Carlyle Reservoir extends into the county. This soil survey can be used in comprehensive regional planning for recreation uses and in individual site selection of recreation areas.

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and soybeans.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail, coyote, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include thrushes, woodpeckers, squirrels, opossum, groundhog, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

In the following paragraphs, the soil associations described under the heading "General Soil Map Units" are grouped into three wildlife areas.

Wildlife area 1 consists of the Piasa-Cowden, Oconee-Darmstadt, and Hoyleton-Cisne-Huey associations. Most of the area is used for soybeans, wheat, and corn, which are grown year after year. Also, much of the area is fall plowed. Wildlife habitat is fair or poor because of a lack of adequate crop residue, herbaceous nesting and roosting cover, woody cover, and travel lanes or hedgerows. It can be improved by establishing or retaining grassy or herbaceous cover, brushy areas, and hedgerows; not mowing the grassy cover until after the nesting season; and leaving crop residue on the surface after harvest.

Wildlife area 2 consists of the Hickory-Marine-Hosmer, Ava-Hickory-Parke, and Bluford-Hickory-Atlas associations. This area borders the major streams in the county. Because it is used as cropland, pasture, and woodland, it provides habitat for a variety of wildlife. Wildlife habitat generally is good, especially in the areas of woodland. It can be improved by managing the pastured areas properly, excluding livestock from the wooded areas, planting trees and shrubs that bear fruit and nuts in the wooded areas, leaving crop residue on the surface after harvest, establishing food plots of grain crops, and not mowing the grassy cover until after the nesting season.

Wildlife area 3 is the Wakeland-Lawson association. It is on the bottom land along Shoal Creek and its tributaries. It is used as cropland, woodland, and pasture. It is inhabited by both upland and wetland wildlife. Wildlife habitat is good or fair. Wetland wildlife habitat can be improved by establishing or preserving areas of open water, increasing the capacity of ditches, pits, dikes, and levees to retain water, and planting millet, buckwheat, sorghum, corn, and other crops that provide food for waterfowl.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use

and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe (*17*). Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of

compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10,

a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that

affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 18.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 18.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing and the amount of soil lost. Soils are grouped according to the following distinctions:

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops.

They are extremely erodible, and vegetation is difficult to establish.

2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control soil blowing are used.

5. Loamy soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control soil blowing are used.

6. Loamy soils that are 18 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.

7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.

8. Stony or gravelly soils and other soils not subject to soil blowing.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

In table 17, some soils are assigned to two hydrologic groups. The first letter is for drained areas and the second for undrained areas.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs, on the average, once or less in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than

that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Engineering Index Test Data

Table 18 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are representative of the series described in the section "Soil Series and Their Morphology." The soil samples were tested by the Illinois Department of Transportation.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are: AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); and Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*15*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Fluvaquents (*Fluv*, meaning flood plain, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Fluvaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, nonacid, mesic Typic Fluvaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the underlying material can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual* (*13*). Many of the technical terms used in the descriptions are defined in *Soil Taxonomy* (*15*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Atlas Series

The Atlas series consists of somewhat poorly drained, very slowly permeable soils on side slopes in the uplands. These soils formed in less than 20 inches of silty sediments and in the underlying Illinoian till. Slope ranges from 5 to 10 percent.

Atlas soils commonly are adjacent to Bluford, Hickory, Hosmer, and Stoy soils. Bluford soils formed in loess over Illinoian till and contain less sand in the upper part of the solum than the Atlas soils. They are on ridges. Hickory soils formed in Illinoian till. They are well drained and are on side slopes along drainageways. Hosmer and

Stoy soils formed in loess and are on ridges. Hosmer soils have a fragipan, and Stoy soils contain less clay and sand in the solum than the Atlas soils.

Typical pedon of Atlas silty clay loam, 5 to 10 percent slopes, severely eroded, 693 feet west and 1,089 feet north of the center of sec. 27, T. 6 N., R. 4 W.

Ap—0 to 5 inches; dark brown (10YR 4/3) silty clay loam, pale brown (10YR 6/3) dry; few medium yellowish brown (10YR 5/6) peds of material from the subsoil; weak fine granular structure grading to weak medium subangular blocky; firm; neutral; abrupt smooth boundary.

2Bt—5 to 13 inches; brown (10YR 5/3) silty clay loam; common medium distinct strong brown (7.5YR 5/8) and yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; firm; common thin grayish brown (2.5Y 5/2) clay films on faces of peds; few fine accumulations (iron and manganese oxide); slightly acid; clear smooth boundary.

2Btg1—13 to 23 inches; grayish brown (2.5Y 5/2) clay loam; common medium prominent strong brown (7.5YR 5/8) and common fine faint gray (5Y 5/1) mottles; weak medium subangular blocky structure; very firm; continuous thin dark grayish brown (10YR 4/2) clay films on faces of peds; few fine pebbles; medium acid; clear smooth boundary.

2Btg2—23 to 34 inches; light brownish gray (2.5Y 6/2) clay loam; common medium distinct yellowish brown (10YR 5/4) and few fine prominent strong brown (7.5YR 5/8) mottles; moderate medium and coarse subangular blocky structure; very firm; continuous thin dark grayish brown (10YR 4/2) clay films on faces of peds; medium acid; clear smooth boundary.

2Btg3—34 to 42 inches; grayish brown (2.5Y 5/2) clay loam; common medium distinct dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm; continuous moderately thick dark gray (10YR 4/1) clay films on faces of peds; few fine pebbles; slightly acid; clear smooth boundary.

2Btg4—42 to 60 inches; grayish brown (2.5Y 5/2) clay loam; common medium distinct dark yellowish brown (10YR 4/6) mottles; moderate medium and coarse subangular blocky structure; firm; continuous moderately thick dark gray (10YR 4/1) clay films on faces of peds; few fine pebbles; neutral; gradual smooth boundary.

2Btg5—60 to 70 inches; light brownish gray (2.5Y 6/2) clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; common moderately thick dark gray (10YR 4/1) clay films lining pores; mildly alkaline.

The solum is more than 60 inches thick. The depth to the Sangamon paleosol is less than 20 inches.

The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3. It is commonly silty clay loam, but the range includes clay loam. The 2Bt horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 1 through 3. It is strongly acid or medium acid in the upper part and slightly acid to mildly alkaline in the lower part. It is clay loam or silty clay. The content of clay in the argillic horizon ranges from 35 to 45 percent.

Ava Series

The Ava series consists of moderately well drained soils on convex ridgetops and side slopes in the uplands. These soils are moderately permeable in the upper part and very slowly permeable in the lower part. They formed in loess over Illinoian till. Slope ranges from 1 to 10 percent.

Ava soils are similar to Hosmer soils and commonly are adjacent to Bluford, Hickory, and Parke soils. Bluford soils are somewhat poorly drained and are on the broader, less sloping ridges below the Ava soils. They have a fine textured Bt horizon. Hickory soils formed in glacial till on side slopes along stream valleys. Hosmer soils formed in a layer of loess thicker than that in which the Ava soils formed. Parke soils are well drained and are on the higher convex ridgetops. They contain more sand in the lower part of the solum than the Ava soils.

Typical pedon of Ava silt loam, 1 to 5 percent slopes, about 4.5 miles north of Mulberry Grove; 858 feet north and 429 feet west of the center of sec. 1, T. 6 N., R. 2 W.

A—0 to 5 inches; dark brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; slightly acid; abrupt smooth boundary.

E—5 to 11 inches; yellowish brown (10YR 5/4) silt loam, very pale brown (10YR 7/4) dry; weak medium granular structure; friable; medium acid; gradual smooth boundary.

BE—11 to 16 inches; yellowish brown (10YR 5/6) silt loam; moderate fine subangular blocky structure; firm; very strongly acid; clear smooth boundary.

Bt—16 to 24 inches; dark yellowish brown (10YR 4/6) silty clay loam; moderate medium subangular blocky structure; firm; many thin dark brown (7.5YR 4/2) clay films on faces of peds; very strongly acid; abrupt smooth boundary.

B/E—24 to 29 inches; brown (7.5YR 5/4) silty clay loam (Bt); strong fine and medium angular blocky structure; firm; many thin dark brown (7.5YR 4/4) clay films on vertical faces of peds; continuous moderately thick light brownish gray (10YR 6/2) silt coatings on faces of peds and on horizontal caps (E); very strongly acid; abrupt irregular boundary.

B't—29 to 38 inches; strong brown (7.5YR 5/6) silty clay loam; common fine faint yellowish brown (10YR 5/4) mottles; strong coarse prismatic structure parting to strong medium angular blocky; firm; continuous thin

dark brown (7.5YR 4/4) clay films on faces of peds; extremely acid; clear smooth boundary.

Bx1—38 to 45 inches; brown (7.5YR 5/4) silt loam; few fine faint yellowish brown (10YR 5/8) mottles; weak very coarse prismatic structure; firm; brittle; continuous thin light brownish gray (10YR 6/2) silt coatings between prisms; few fine irregular dark reddish brown (5YR 3/2) stains (iron and manganese oxide); strongly acid; clear smooth boundary.

2Bx2—45 to 51 inches; yellowish brown (10YR 5/4) silt loam; few fine faint pale brown (10YR 6/3) mottles; weak very coarse prismatic structure; firm; brittle; discontinuous thin light brownish gray (10YR 6/2) silt coatings between prisms; strongly acid; clear smooth boundary.

2C—51 to 60 inches; brown (7.5YR 5/4) loam; common fine faint light yellowish brown (10YR 6/4) mottles; massive; friable; medium acid.

The thickness of the solum ranges from 40 to 70 inches. The depth to the fragipan is 25 to 38 inches. The thickness of the loess ranges from 35 to 45 inches.

The A horizon has value of 4 or 5 and chroma of 2 or 3. The E horizon has value of 4 or 5 and chroma of 3 or 4. Some pedons do not have an E horizon. The Bt horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 3 through 6. It is silt loam or silty clay loam. The content of clay in this horizon ranges from 24 to 32 percent. The B't horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 through 6. The 2Bx horizon has hue of 10YR, value of 5 or 6, and chroma of 2 through 4. It is silt loam, loam, or clay loam. The B and 2B horizons are strongly acid to extremely acid.

Beaucoup Series

The Beaucoup series consists of poorly drained, moderately permeable soils in depressions on bottom land. These soils formed in silty alluvium. Slope ranges from 0 to 2 percent.

Beaucoup soils are similar to Birds soils and commonly are adjacent to Lawson and Tice soils. Birds soils do not have a mollic epipedon. They are more stratified than the Beaucoup soils and are slightly higher on the landscape. Lawson and Tice soils are somewhat poorly drained and are higher on the landscape than the Beaucoup soils.

Typical pedon of Beaucoup silty clay loam, about 2 miles west of Greenville; 198 feet north and 264 feet east of the southwest corner of sec. 9, T. 5 N., R. 3 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; moderate fine angular blocky structure parting to weak fine granular; firm; slightly acid; abrupt smooth boundary.

A—7 to 19 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; common fine faint very dark grayish brown (10YR 3/2) and dark brown (10YR 3/3) mottles; weak fine and medium angular blocky structure parting to weak coarse granular; firm; few concretions (iron and manganese oxide); neutral; clear smooth boundary.

Bg1—19 to 25 inches; dark gray (10YR 4/1) silty clay loam; few fine faint dark yellowish brown (10YR 3/6) mottles; weak medium angular blocky structure; firm; neutral; clear smooth boundary.

Bg2—25 to 33 inches; very dark gray (10YR 3/1) silty clay loam; common fine faint dark yellowish brown (10YR 3/4) mottles; moderate fine and medium prismatic structure parting to weak medium subangular blocky; firm; mildly alkaline; clear smooth boundary.

BCg—33 to 43 inches; very dark grayish brown (2.5Y 3/2) silty clay loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; weak coarse prismatic structure; firm; mildly alkaline; clear smooth boundary.

Cg1—43 to 51 inches; dark gray (10YR 4/1) silt loam; few fine faint dark grayish brown (10YR 4/2) mottles; massive; firm; mildly alkaline; abrupt smooth boundary.

Cg2—51 to 56 inches; gray (10YR 5/1) silty clay loam; common fine and medium distinct dark yellowish brown (10YR 4/6) mottles; massive; firm; mildly alkaline; clear smooth boundary.

Cg3—56 to 60 inches; dark gray (10YR 4/1) silty clay loam; common medium distinct dark yellowish brown (10YR 3/6) mottles; massive; firm; mildly alkaline.

The thickness of the solum ranges from 40 to 60 inches. The mollic epipedon ranges from 10 to 23 inches in thickness.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bg horizon has hue of 10YR through 5Y, value of 3 through 6, and chroma of 1 or 2. It is slightly acid to mildly alkaline. The content of clay in this horizon ranges from 27 to 35 percent.

Birds Series

The Birds series consists of poorly drained, moderately slowly permeable soils on bottom land along the major streams. These soils formed in silty alluvium. Slope ranges from 0 to 2 percent.

Birds soils commonly are adjacent to Beaucoup, Hickory, and Wakeland soils. Beaucoup soils have a mollic epipedon and are less stratified than the Birds soils. They are in sloughs and depressions. Hickory soils are well drained and are on side slopes in the uplands. Wakeland soils are coarse-silty. They are somewhat poorly drained and are on natural levees near stream channels.

Typical pedon of Birds silt loam, about 3 miles north and 0.25 mile west of Greenville; 1,914 feet west and 1,188 feet north of the southeast corner of sec. 27, T. 6 N., R. 3 W.

Ap—0 to 8 inches; dark gray (10YR 4/1) silt loam, light gray (10YR 6/1) dry; common fine and medium distinct dark brown (10YR 3/3) mottles; weak fine and medium granular structure; friable; neutral; abrupt smooth boundary.

Cg1—8 to 23 inches; dark gray (10YR 4/1) silt loam; common fine distinct brown (10YR 4/3) mottles; weak medium and fine granular structure; friable; neutral; gradual smooth boundary.

Cg2—23 to 38 inches; light brownish gray (2.5Y 6/2) silt loam; common fine and medium distinct yellowish brown (10YR 5/8) and brownish yellow (10YR 6/6) mottles; massive; friable; neutral; diffuse smooth boundary.

Cg3—38 to 53 inches; grayish brown (2.5Y 5/2) silt loam; common fine and medium distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/8) mottles; massive; friable; mildly alkaline; diffuse smooth boundary.

Cg4—53 to 60 inches; gray (10YR 5/1) stratified silt loam and silty clay loam; common fine and medium distinct dark yellowish brown (10YR 4/6) mottles; massive; firm; neutral.

The A horizon is 7 to 10 inches thick. It has value of 4 or 5 and chroma of 1 or 2. The C horizon has hue of 10YR or 2.5Y, value of 4 through 7, and chroma of 1 or 2. The content of clay in the control section ranges from 18 to 27 percent. This section is dominantly silt loam but has thin strata of silty clay loam, loam, and sandy loam. It is medium acid to mildly alkaline.

Bluford Series

The Bluford series consists of somewhat poorly drained soils on ridges in the uplands. These soils are moderately slowly permeable in the upper part and slowly permeable in the lower part. They formed in loess over Illinoian till. Slope ranges from 0 to 5 percent.

Bluford soils are similar to Marine soils and commonly are adjacent to Ava, Hickory, and Wynoose soils. The moderately well drained Ava soils are on the higher ridges. They have a fragipan. The well drained Hickory soils formed in glacial till on side slopes along stream valleys. Marine soils are in positions on the landscape similar to those of the Bluford soils. They formed in a layer of loess thicker than that in which the Bluford soils formed. They are characterized by an abrupt textural change between the E and B horizons. The poorly drained Wynoose soils are on broad plains and in depressions. They are characterized by an abrupt textural change between the E and B horizons.

Typical pedon of Bluford silt loam, 0 to 2 percent slopes, 1,287 feet south and 106 feet east of the northwest corner of sec. 11, T. 4 N., R. 3 W.

Ap—0 to 8 inches; brown (10YR 5/3) silt loam, very pale brown (10YR 7/3) dry; weak fine granular structure; friable; neutral; abrupt smooth boundary.

E—8 to 13 inches; pale brown (10YR 6/3) silt loam, very pale brown (10YR 8/3) dry; common fine distinct light gray (10YR 6/1) mottles; weak very coarse platy structure parting to very weak fine granular; friable; common silt coatings on faces of peds, white (10YR 8/1) dry; common very small concretions (iron and manganese oxide) and a few more than 2 millimeters in diameter; medium acid; clear smooth boundary.

Btg1—13 to 18 inches; brown (10YR 5/3) silty clay loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; strong fine prismatic structure parting to strong fine and medium angular blocky; very firm; continuous thin grayish brown (10YR 5/2) clay films on faces of peds; many moderately thick light gray (10YR 7/2) silt coatings on horizontal faces of peds; very strongly acid; clear smooth boundary.

Btg2—18 to 25 inches; pale brown (10YR 6/3) silty clay loam; many fine and medium distinct yellowish brown (10YR 5/8) and few fine distinct brown (7.5YR 4/4) mottles; moderate medium prismatic structure parting to strong medium angular blocky; very firm; continuous moderately thick grayish brown (10YR 5/2) clay films on faces of peds; few small black (10YR 2/1) concretions (iron and manganese oxide); very strongly acid; clear irregular boundary.

B/E—25 to 29 inches; light brownish gray (10YR 6/2) silty clay loam (Btg); many medium and coarse distinct strong brown (7.5YR 5/8) mottles; moderate medium angular blocky structure; firm; common moderately thick light gray (10YR 7/2) silt coatings on faces of peds (E); few small very dark grayish brown (10YR 3/2) concretions (iron and manganese oxide); very strongly acid; clear irregular boundary.

Btg—29 to 35 inches; light brownish gray (10YR 6/2) silty clay loam; many medium and coarse prominent dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/8) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; many moderately thick grayish brown (10YR 5/2) clay films on faces of peds; few very dark grayish brown (10YR 3/2) stains (iron and manganese oxide); very strongly acid; clear wavy boundary.

Bxg1—35 to 41 inches; light brownish gray (10YR 6/2) silt loam; common coarse distinct strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure; firm; slightly brittle; common thin grayish brown (10YR 5/2) clay films on faces of prisms; common medium irregular dark reddish brown (5YR

3/2) accumulations (iron and manganese oxide); strongly acid; clear wavy boundary.

2Bxg2—41 to 52 inches; pinkish gray (7.5YR 6/2) silt loam; many medium and coarse distinct brown (7.5YR 4/4) and yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; firm; slightly brittle; medium acid; clear smooth boundary.

2Bxg3—52 to 65 inches; pinkish gray (7.5YR 6/2) silt loam; many coarse distinct brown (7.5YR 4/4) mottles; weak very coarse prismatic structure; firm; brittle; few small pebbles; slightly acid.

The thickness of the solum ranges from 40 to more than 60 inches. The depth to the 2B horion ranges from 30 to 45 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The E horizon has value of 5 or 6 and chroma of 2 through 4. Some pedons do not have an E horizon. The Bt horizon has hue of 10YR, value of 4 through 6, and chroma of 2 through 6. It is strongly acid to extremely acid. It is silty clay loam or silty clay. The content of clay in this horizon ranges from 35 to 45 percent. The 2Bx horizon is silt loam, loam, or silty clay loam. It has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 2 through 4. It is very strongly acid to slightly acid.

Chauncey Series

The Chauncey series consists of poorly drained, slowly permeable soils on the concave foot slopes of ridges in the uplands. These soils formed in loess. Slope ranges from 0 to 3 percent.

Chauncey soils are similar to Ebbert soils and commonly are adjacent to Cisne, Cowden, Hoyleton, and Oconee soils. The adjacent soils do not have a mollic epipedon. Cisne and Cowden soils are on broad plains. Hoyleton and Oconee soils are somewhat poorly drained and are on ridges above the Chauncey soils. Ebbert soils have a fine-silty Bt horizon. They are in shallow depressions.

Typical pedon of Chauncey silt loam, 0 to 3 percent slopes, 50 feet north and 115 feet east of the southwest corner of sec. 20, T. 4 N., R. 3 W.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—10 to 13 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; slightly acid; gradual smooth boundary.

E1—13 to 19 inches; dark grayish brown (10YR 4/2) silt loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; weak coarse platy structure parting to weak fine granular; friable; medium acid; gradual smooth boundary.

E2—19 to 28 inches; grayish brown (10YR 5/2) silt loam; common fine distinct dark yellowish brown (10YR 4/6) mottles; weak fine granular structure; friable; few fine black (10YR 2/1) concretions (iron and manganese oxide); strongly acid; abrupt smooth boundary.

Btg1—28 to 34 inches; dark gray (10YR 4/1) silty clay; many coarse distinct dark yellowish brown (10YR 4/6) mottles; strong medium prismatic structure parting to strong medium angular blocky; very firm; continuous thick dark gray (10YR 4/1) clay films on faces of peds; strongly acid; gradual smooth boundary.

Btg2—34 to 50 inches; gray (10YR 5/1) silty clay loam; many fine to coarse prominent strong brown (7.5YR 5/6) mottles; moderate coarse prismatic structure parting to weak medium and coarse angular blocky; firm; few fine distinct stains (iron and manganese oxide); continuous thick dark gray (10YR 4/1) clay films on faces of peds; strongly acid; gradual smooth boundary.

Btg3—50 to 60 inches; light gray (10YR 6/1) silty clay loam; common fine and medium prominent strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure; firm; many thin dark gray (10YR 4/1) clay films on faces of peds; slightly acid.

The thickness of the solum ranges from 45 to 65 inches. The mollic epipedon is 10 to 15 inches thick. The E horizon is 14 to 25 inches thick.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The E horizon has value of 4 through 7 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 2 or less and has mottles with higher chroma. It is strongly acid or medium acid in the upper part and medium acid or slightly acid in the lower part. It is silty clay loam or silty clay. The content of clay in this horizon ranges from 35 to 42 percent.

Cisne Series

The Cisne series consists of poorly drained, very slowly permeable soils on broad upland plains. These soils formed in loess over Illinoian till. Slope ranges from 0 to 2 percent.

Cisne soils are similar to Cowden soils and commonly are adjacent to Darmstadt, Ebbert, Hoyleton, Huey, and Newberry soils. Cowden soils formed in a layer of loess thicker than that in which the Cisne soils formed. Darmstadt soils are somewhat poorly drained and are on ridges. They have a natric horizon. Ebbert soils have a mollic epipedon. They are in shallow depressions. Hoyleton soils are somewhat poorly drained and are on ridges. Huey soils have a natric horizon. They occur as areas closely intermingled with areas of the Cisne soils. Newberry soils contain less clay in the Bt horizon than the Cisne soils. They are in wide depressions.

Typical pedon of Cisne silt loam, 180 feet west and 180 feet north of the southeast corner of sec. 4, T. 6 N., R. 2 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; neutral; abrupt smooth boundary.

E1—7 to 13 inches; grayish brown (10YR 5/2) silt loam; many medium faint dark grayish brown (10YR 4/2) mottles; weak medium platy structure; friable; very strongly acid; clear smooth boundary.

E2—13 to 16 inches; light gray (10YR 7/1) silt loam; few fine distinct brownish yellow (10YR 6/8) mottles; moderate medium platy structure; friable; very strongly acid; abrupt smooth boundary.

B/E—16 to 18 inches; grayish brown (10YR 5/2) silty clay loam (Bt); common fine distinct dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; firm; many thin dark grayish brown (10YR 4/2) clay films on faces of peds; common thick light gray (10YR 7/1) silt coatings on faces of peds (E); very strongly acid; abrupt smooth boundary.

Btg1—18 to 26 inches; grayish brown (10YR 5/2) silty clay; common fine and medium distinct dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure; very firm; continuous thick very dark grayish brown (10YR 3/2) clay films on faces of peds; very strongly acid; clear smooth boundary.

Btg2—26 to 38 inches; grayish brown (2.5Y 5/2) silty clay; few medium distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; firm; continuous thick grayish brown (10YR 5/2) clay films on faces of peds; very strongly acid; gradual smooth boundary.

2Btg3—38 to 46 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure; firm; many thin grayish brown (10YR 5/2) clay films on faces of peds; medium acid; gradual smooth boundary.

2Cg—46 to 60 inches; light brownish gray (2.5Y 6/2) clay loam; few medium prominent strong brown (7.5YR 5/6) mottles; massive; firm; slightly acid.

The thickness of the solum ranges from 40 to 65 inches. The thickness of the loess ranges from 30 to 45 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The E horizon has value of 5 through 7 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2 and has mottles with higher chroma. It generally is strongly acid or very strongly acid but in some pedons is medium acid in the lower part. It is silty clay loam or silty clay. The content of clay in this horizon ranges from 35 to 42 percent. The 2B and 2C horizons are clay loam, silty clay loam, or silt loam.

Cowden Series

The Cowden series consists of poorly drained, slowly permeable soils on broad upland plains. These soils formed in loess. Slope ranges from 0 to 2 percent.

Cowden soils are similar to Cisne soils and commonly are adjacent to Ebbert, Herrick, Oconee, and Piasa soils. Cisne soils formed in a layer of loess thinner than that in which the Cowden soils formed. They have a 2B horizon. Ebbert and Herrick soils have a mollic epipedon. Ebbert soils are in shallow depressions, and Herrick soils are slightly higher on the landscape than the Cowden soils. Piasa soils have a mollic epipedon and a natric horizon. They occur as areas closely intermingled with areas of the Cowden soils. The somewhat poorly drained Oconee soils are on ridges. Unlike the Cowden soils, they are not characterized by an abrupt textural change between the E and B horizons.

Typical pedon of Cowden silt loam, in an area of Cowden-Piasa silt loams, 1,355 feet south and 2,116 feet west of the northeast corner of sec. 19, T. 6 N., R. 3 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, gray (10YR 5/1) dry; weak medium granular structure; friable; few fine black (10YR 2/1) concretions (iron and manganese oxide); slightly acid; abrupt smooth boundary.

E1—8 to 13 inches; dark gray (10YR 4/1) silt loam; weak coarse platy structure parting to weak fine granular; friable; few fine black (10YR 2/1) and dark yellowish brown (10YR 4/4) concretions (iron and manganese oxide); medium acid; clear smooth boundary.

E2—13 to 16 inches; gray (10YR 5/1) silt loam; moderate fine subangular blocky structure; friable; few fine black (10YR 2/1) and dark yellowish brown (10YR 4/4) concretions (iron and manganese oxide); strongly acid; abrupt smooth boundary.

Btg1—16 to 26 inches; dark grayish brown (10YR 4/2) silty clay loam; common fine and medium distinct dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate fine and medium angular blocky; firm; thick continuous black (10YR 2/1) and dark gray (10YR 4/1) clay films; few fine and medium black (10YR 2/1) and dark yellowish brown (10YR 4/6) concretions (iron and manganese oxide); strongly acid; clear smooth boundary.

Btg2—26 to 33 inches; grayish brown (10YR 5/2) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure parting to moderate fine angular blocky; firm; thick continuous dark gray (10YR 4/1) clay

films; few fine strong brown (7.5YR 5/6) concretions (iron and manganese oxide); slightly acid; clear smooth boundary.

Btg3—33 to 44 inches; grayish brown (10YR 5/2) silty clay loam; common fine distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate fine and medium angular blocky; firm; thick continuous gray (10YR 5/1) clay films; neutral; gradual smooth boundary.

BCg—44 to 55 inches; gray (10YR 5/1) silty clay loam; many medium distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/4) mottles; weak coarse angular blocky structure; firm; thin discontinuous dark gray (10YR 4/1) clay films; neutral; gradual wavy boundary.

2Ab—55 to 60 inches; mottled light brownish gray (10YR 6/2) and very dark grayish brown (10YR 3/2) silt loam and black (10YR 2/1) silty clay loam; common medium faint dark yellowish brown (10YR 3/4) mottles; weak medium subangular blocky structure; firm; mildly alkaline.

The thickness of the solum ranges from 40 to 65 inches. The thickness of the A horizon combined with that of the E horizon ranges from 12 to 18 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The E horizon has value of 4 or 5 in the upper part and 4 through 6 in the lower part. It has chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 or 2. It is silty clay loam or silty clay. The content of clay in the upper 20 inches of this horizon ranges from 35 to 45 percent. The B horizon is strongly acid or very strongly acid in the upper part and medium acid to neutral in the lower part.

Creal Series

The Creal series consists of somewhat poorly drained, moderately slowly permeable soils on foot slopes or at the head of drainageways in the uplands. These soils formed in loess or silty alluvium. Slope ranges from 0 to 3 percent.

Creal soils commonly are adjacent to Kendall, Parke, Pike, and Wakeland soils. Kendall soils are on terraces and are lower on the landscape than the Creal soils. Also, they have a thinner E horizon. Parke and Pike soils are well drained and are on side slopes in the uplands. Wakeland soils are more stratified than the Creal soils. They are on bottom land.

Typical pedon of Creal silt loam, 0 to 3 percent slopes, 2,300 feet south and 540 feet east of the northwest corner of sec. 6, T. 4 N., R. 3 W.

Ap—0 to 8 inches; dark brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; neutral; clear smooth boundary.

E1—8 to 15 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium platy structure; friable; common thin dark brown (10YR 4/3) silt coatings on faces of peds; neutral; clear smooth boundary.

E2—15 to 25 inches; yellowish brown (10YR 5/4) silt loam; weak medium platy structure; friable; few thin yellowish brown (10YR 5/6) silt coatings on faces of peds; very strongly acid; clear smooth boundary.

BE—25 to 28 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; many thin light yellowish brown (10YR 6/4) clay films on faces of peds; common thin silt coatings on faces of peds, light gray (10YR 7/2) dry; strongly acid; clear smooth boundary.

Bt1—28 to 33 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm; many moderately thick dark yellowish brown (10YR 4/4) clay films on faces of peds; common thin silt coatings on faces of peds, white (10YR 8/2) dry; strongly acid; clear smooth boundary.

Bt2—33 to 43 inches; brown (10YR 5/3) silt loam; common fine faint grayish brown (10YR 5/2) and common fine distinct strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; continuous moderately thick dark yellowish brown (10YR 4/4) clay films on faces of peds; strongly acid; clear smooth boundary.

BCg—43 to 53 inches; grayish brown (10YR 5/2) silt loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; friable; strongly acid; gradual smooth boundary.

C—53 to 60 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct reddish yellow (7.5YR 6/6) mottles; massive; friable; strongly acid.

The thickness of the solum ranges from 35 to 60 inches. The thickness of the A horizon combined with that of the E horizon ranges from 24 to 30 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The E horizon has value of 4 through 6 and chroma of 3 or 4. The Bt horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 2 through 4. It is strongly acid or very strongly acid. The content of clay in this horizon ranges from 27 to 35 percent.

Darmstadt Series

The Darmstadt series consists of somewhat poorly drained, very slowly permeable soils on broad ridges and side slopes in the uplands. These soils formed in loess. Slope ranges from 0 to 5 percent.

Darmstadt soils are similar to Huey soils and commonly are adjacent to Atlas, Cisne, Hoyleton, and Oconee soils. The adjacent soils do not have a natric horizon. Atlas soils contain more clay in the B horizon than the Darmstadt soils. They are along drainageways. The poorly drained Cisne and Huey soils are on broad plains below the Darmstadt soils. Hoyleton and Oconee soils commonly occur as areas closely intermingled with areas of the Darmstadt soils on plains and broad ridges. Their Bt horizon is finer textured than that of the Darmstadt soils.

Typical pedon of Darmstadt silt loam, 0 to 2 percent slopes, 1,365 feet west and 400 feet north of the southeast corner of sec. 17, T. 4 N., R. 4 W.

Ap—0 to 7 inches; brown (10YR 5/3) silt loam, light gray (10YR 7/2) dry; weak fine granular structure; friable; many fine rounded concretions and accumulations (iron and manganese oxide); neutral; clear smooth boundary.

E—7 to 10 inches; grayish brown (10YR 5/2) silt loam; common fine brown (10YR 4/3) worm casts; weak fine granular structure; slightly acid; abrupt smooth boundary.

Btn1—10 to 17 inches; yellowish brown (10YR 5/4) silty clay loam; common fine faint grayish brown (10YR 5/2) and dark grayish brown (10YR 4/2) mottles throughout and few medium distinct strong brown (7.5YR 5/6) mottles in the upper part; moderate fine and medium subangular blocky structure; firm; continuous moderately thick brown (7.5YR 4/2) clay films on faces of peds; few fine rounded accumulations (iron and manganese oxide); neutral; clear smooth boundary.

Btn2—17 to 21 inches; light brownish gray (10YR 6/2) silty clay loam; common fine prominent yellowish red (5YR 5/8) and yellowish brown (10YR 5/6) mottles; weak fine and medium prismatic structure; firm; continuous thin light olive brown (2.5Y 5/4) clay films on faces of peds; common medium rounded dark reddish brown (5YR 2/2) accumulations (iron and manganese oxide); mildly alkaline; clear smooth boundary.

Btn3—21 to 28 inches; gray (10YR 6/1) silty clay loam; common fine prominent strong brown (7.5YR 4/6) and few medium prominent yellowish red (5YR 5/8) mottles; weak medium prismatic structure; firm; few thin grayish brown (2.5Y 5/2) clay films on vertical faces of peds; few medium irregular accumulations (iron and manganese oxide); mildly alkaline; clear smooth boundary.

Btn4—28 to 35 inches; gray (10YR 6/1) silty clay loam; common fine and medium prominent strong brown (7.5YR 4/6) and few fine distinct grayish brown (10YR 5/2) mottles; weak medium prismatic structure; friable; few thin light olive brown (2.5Y 5/4) clay films on vertical faces of peds; few coarse irregular accumulations (iron and manganese oxide); few medium irregular calcium carbonate concretions; mildly alkaline; gradual smooth boundary.

BCn—35 to 45 inches; light brownish gray (10YR 6/2) silt loam; common fine prominent strong brown (7.5YR 4/6) mottles; weak coarse prismatic structure; friable; few medium and coarse irregular accumulations (iron and manganese oxide); moderately alkaline; clear smooth boundary.

Cn—45 to 60 inches; gray (5Y 6/1) silt loam; common coarse prominent brown (7.5YR 4/4) and strong brown (7.5YR 5/8) mottles; massive; brittle; moderately alkaline.

The solum ranges from 45 to 60 inches in thickness. It is strongly acid to neutral in the upper part and strongly alkaline to mildly alkaline in the lower part. The depth to the natric horizon ranges from 10 to 16 inches.

The Ap horizon has value of 3 through 6 and chroma of 2 or 3. It is silt loam or silty clay loam. The E horizon has value of 4 through 6 and chroma of 2 through 4. Some pedons do not have an E horizon. The Btn horizon has hue of 10YR, value of 4 through 7, and chroma of 1 through 4 and has mottles with higher chroma. It is silty clay loam or silty clay. The content of clay in this horizon ranges from 27 to 35 percent.

The Darmstadt soil in the map unit Oconee-Darmstadt silt loams, 2 to 5 percent slopes, eroded, contains more clay in the control section than is defined as the range for the series. This difference, however, does not alter the usefulness or behavior of the soil.

Douglas Series

The Douglas series consists of well drained, moderately permeable soils on ridges in the uplands. These soils formed in loess over glacial drift. Slope ranges from 2 to 7 percent.

Douglas soils are similar to Pike soils and commonly are adjacent to Cowden, Darmstadt, Oconee, and Piasa soils. The poorly drained Cowden and Piasa soils are on broad flats and are lower on the landscape than the Douglas soils. Also, their Bt horizon contains more clay. Darmstadt and Piasa soils have a natric horizon. Also, Darmstadt soils are somewhat poorly drained and occur as areas closely intermingled with areas of the Oconee soils. Pike soils do not have a mollic epipedon. The somewhat poorly drained Oconee soils are on the lower ridges. Their Bt horizon contains more clay than that of the Douglas soils.

Typical pedon of Douglas silt loam, 2 to 7 percent slopes, 460 feet east and 1,460 feet south of the northwest corner of sec. 29, T. 4 N., R. 4 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine

granular structure; friable; neutral; abrupt smooth boundary.

A—7 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; slightly acid; clear smooth boundary.

Bt1—11 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; friable; continuous thin very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common medium irregular accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

Bt2—15 to 21 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; continuous thin strong brown (7.5YR 4/6) and dark brown (7.5YR 3/4) clay films on faces of peds; many thin black (N 2/0) organic coatings on faces of peds; common medium irregular accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

Bt3—21 to 31 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; discontinuous thin strong brown (7.5YR 4/6) and dark brown (7.5YR 3/4) clay films on faces of peds; many medium irregular accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

Bt4—31 to 43 inches; yellowish brown (10YR 5/4) silt loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; many thin strong brown (7.5YR 4/6) clay films and pale brown (10YR 6/3) silt coatings on faces of peds; many medium irregular accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

2Bt5—43 to 57 inches; brown (7.5YR 4/4) silt loam; weak coarse prismatic structure; friable; many thin dark brown (7.5YR 4/2) clay films and pale brown (10YR 6/3) silt coatings on faces of peds; many medium irregular accumulations (iron and manganese oxide); slightly acid; clear smooth boundary.

2Bt6—57 to 60 inches; brown (7.5YR 4/4) silt loam; weak coarse prismatic structure; friable; common thin reddish brown (5YR 4/3) clay films on faces of peds; very thick dark brown (7.5YR 4/2) and black (N 2/0) clay films lining worm channels; common pebbles; slightly acid.

The thickness of the solum ranges from 60 to more than 80 inches. The thickness of the loess ranges from 40 to 60 inches. The A horizon is 10 to 14 inches thick.

The Ap horizon has value of 3 and chroma of 2 or 3. The Bt horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 3 or 4. It is medium acid or strongly acid. It is dominantly silty clay loam but has thin subhorizons of silt loam. The content of clay in this horizon ranges from 27 to 35 percent. The 2Bt horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. It is medium acid to neutral.

Ebbert Series

The Ebbert series consists of poorly drained, slowly permeable soils in depressions on uplands. These soils formed in loess. Slope ranges from 0 to 2 percent.

Ebbert soils are similar to Chauncey soils and commonly are adjacent to Cisne, Cowden, Newberry, and Virden soils. The Bt horizon of Chauncey soils is finer textured than that of the Ebbert soils. Cisne, Cowden, and Newberry soils do not have a mollic epipedon. They are on plains and are higher on the landscape than the Ebbert soils. Also, Cisne and Newberry soils formed in a thinner layer of loess. They have a 2B horizon. Virden soils do not have an E horizon. They are on the slightly higher flats.

Typical pedon of Ebbert silt loam, 1,310 feet north and 1,330 feet east of the southwest corner of sec. 20, T. 6 N., R. 3 W.

Ap—0 to 6 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak medium granular structure; friable; slightly acid; abrupt smooth boundary.

A—6 to 16 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; few fine distinct dark yellowish brown (10YR 3/4) mottles; moderate coarse and fine granular structure; friable; medium acid; gradual smooth boundary.

Eg—16 to 22 inches; dark gray (10YR 4/1) silt loam; few fine distinct dark yellowish brown (10YR 3/4) mottles; weak medium granular structure; friable; medium acid; abrupt smooth boundary.

Bg—22 to 31 inches; gray (10YR 5/1) silty clay loam; common medium and coarse prominent dark brown (7.5YR 4/4) mottles; weak coarse prismatic structure parting to weak coarse angular blocky; firm; medium acid; gradual smooth boundary.

Btg1—31 to 45 inches; gray (5Y 5/1) silty clay loam; common fine and medium distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate coarse angular blocky; firm; dark gray (10YR 4/1) organic matter and clay in crayfish burrows; many moderately thick gray (5Y 5/1) clay films on faces of prisms; slightly acid; gradual smooth boundary.

Btg2—45 to 54 inches; gray (5Y 5/1) silty clay loam; many medium and coarse prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; firm; many moderately thick gray (5Y 5/1)

clay films on faces of prisms; slightly acid; gradual smooth boundary.

2Abg—54 to 60 inches; mottled gray (5Y 6/1) and dark grayish brown (10YR 4/2) silty clay loam; common fine and medium prominent dark yellowish brown (10YR 3/4) mottles; moderate medium and coarse angular blocky structure; firm; slightly acid.

The thickness of the solum ranges from 45 to 60 inches. The thickness of the mollic epipedon ranges from 10 to 17 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. It is dominantly silt loam but in some pedons is silty clay loam. The B horizon has hue of 10YR through 5Y, value of 4 or 5, and chroma of 1 or 2 and has mottles with higher chroma. It is silty clay loam that ranges from 27 to 35 percent clay. It is medium acid or strongly acid in the upper part and medium acid or slightly acid in the lower part. The 2Abg horizon is silty clay loam, loam, silt loam, or clay loam. Some pedons have a C or 2C horizon.

Gosport Series

The Gosport series consists of moderately deep, moderately well drained, very slowly permeable soils on the sides of drainageways in the uplands. These soils formed in residuum of shale. Slope ranges from 15 to 30 percent.

These soils are taxadjuncts to the Gosport series because they have an argillic horizon. This difference, however, does not significantly affect the usefulness or behavior of the soils.

Gosport soils commonly are adjacent to Hickory, Hosmer, and Lawson soils. The adjacent soils do not have bedrock within a depth of 60 inches. Hickory soils are fine-loamy. They occur as areas closely intermingled with areas of the Gosport soils on the upper part of the side slopes. Hosmer soils formed in loess on ridges above the Gosport soils. Lawson soils are somewhat poorly drained and are on bottom land.

Typical pedon of Gosport silt loam, in an area of Hickory-Gosport complex, 15 to 30 percent slopes, 1,740 feet east and 720 feet north of the southwest corner of sec. 16, T. 6 N., R. 4 W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable; slightly acid; clear smooth boundary.

Bt1—5 to 19 inches; yellowish brown (10YR 5/4) silty clay; moderate medium subangular blocky structure; firm; continuous thin dark yellowish brown (10YR 4/4) clay films on faces of peds; few grayish brown (2.5Y 5/2) shale fragments; few fine irregular accumulations (iron and manganese oxide); extremely acid; clear smooth boundary.

Bt2—19 to 24 inches; yellowish brown (10YR 5/4) silty clay; common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; very firm; continuous moderately thick brown (7.5YR 4/4) clay films on faces of peds; few grayish brown (2.5Y 5/2) shale fragments; few fine irregular accumulations (iron and manganese oxide); extremely acid; clear smooth boundary.

Bw—24 to 34 inches; grayish brown (2.5Y 5/2) silty clay; common medium distinct strong brown (7.5YR 4/6) mottles; very weak medium subangular blocky structure; firm; many thin dark yellowish brown (10YR 4/4) ped exteriors; common medium irregular accumulations (iron oxide); extremely acid; clear smooth boundary.

Cr—34 to 60 inches; gray (5Y 5/1) clay shale; weak thick platy structure; extremely firm; common medium distinct grayish brown (2.5Y 5/2) horizontal bands; many medium irregular accumulations (iron oxide); very strongly acid.

The thickness of the solum ranges from 20 to 38 inches. The A horizon is 5 to 10 inches thick. It is silt loam or silty clay loam. The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 through 4. The content of clay in the control section ranges from 36 to 55 percent. The Cr horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 1 through 4.

Grantfork Series

The Grantfork series consists of deep, somewhat poorly drained, slowly permeable soils on side slopes in the uplands. These soils formed in glacial till. Slope ranges from 4 to 10 percent.

Grantfork soils commonly are adjacent to Atlas, Darmstadt, and Hickory soils. Atlas soils do not have a natric horizon. They occur as areas closely intermingled with areas of the Grantfork soils. Darmstadt soils formed in loess at head of drainageways. Hickory soils are well drained and are on the steeper side slopes. They do not have a natric horizon.

Typical pedon of Grantfork silty clay loam, in an area of Atlas-Grantfork silty clay loams, 4 to 10 percent slopes, severely eroded, 1,584 feet west and 700 feet north of the center of sec. 35, T. 6 N., R. 5 W.

Ap—0 to 3 inches; dark brown (10YR 3/3) silty clay loam; moderate fine granular structure; friable; neutral; abrupt smooth boundary.

Bt—3 to 13 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine and medium distinct strong brown (7.5YR 5/6) mottles throughout, few fine faint light brownish gray (10YR 6/2) mottles in the upper part, and few medium faint light brownish gray (10YR 6/2) mottles in the lower part; moderate fine and medium subangular blocky structure; friable;

many thin dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded concretions (iron and manganese oxide); few pebbles; neutral; clear smooth boundary.

Btn—13 to 20 inches; yellowish brown (10YR 5/4) silty clay loam; many medium distinct light brownish gray (10YR 6/2) and grayish brown (10YR 5/2) and many fine distinct strong brown (7.5YR 5/6) and brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; firm; patchy thin dark grayish brown (10YR 4/2) clay films on faces of peds; common medium rounded concretions (iron and manganese oxide); few pebbles; moderately alkaline; clear smooth boundary.

Btng1—20 to 27 inches; grayish brown (10YR 5/2) clay loam; few medium distinct strong brown (7.5YR 5/6 and 5/8) and few fine distinct reddish yellow (7.5YR 6/6) mottles; weak medium subangular blocky structure; firm; few thin dark grayish brown (10YR 4/2) clay films on faces of peds; common medium rounded concretions (iron and manganese oxide); few pebbles; moderately alkaline; clear smooth boundary.

Btng2—27 to 34 inches; grayish brown (10YR 5/2) clay loam; few medium faint yellowish brown (10YR 5/4), few fine distinct brown (7.5YR 4/4) and strong brown (7.5YR 5/8), and common fine distinct strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; few thin dark grayish brown (10YR 4/2) clay films on faces of peds; common pebbles; moderately alkaline; clear smooth boundary.

Btng3—34 to 41 inches; grayish brown (10YR 5/2) clay loam; common medium distinct strong brown (7.5YR 5/8) and common medium prominent reddish brown (5YR 4/4) mottles; weak coarse subangular blocky structure; firm; common thin dark grayish brown (10YR 4/2) clay films on faces of peds; common fine rounded concretions and common medium irregular black (10YR 2/1) accumulations (iron and manganese oxide); moderately alkaline; clear smooth boundary.

BCng—41 to 54 inches; light brownish gray (10YR 6/2) clay loam; common medium distinct strong brown (7.5YR 5/6), common fine distinct strong brown (7.5YR 5/8), common medium prominent reddish brown (5YR 4/4), and common fine prominent yellowish red (5YR 5/8) mottles; weak coarse prismatic structure; firm; common medium strong brown (7.5YR 5/6) rounded concretions and many medium and coarse black (10YR 2/1) irregular accumulations (iron and manganese oxide); common pebbles; moderately alkaline; clear smooth boundary.

Cng—54 to 60 inches; light brownish gray (2.5Y 6/2) clay loam; common medium distinct strong brown (7.5YR 5/6), few medium distinct strong brown (7.5YR 5/8), and common medium prominent yellowish red (5YR 5/8) mottles; weak coarse prismatic structure; firm; few medium black (10YR 2/1) irregular accumulations (iron and manganese oxide); common pebbles; moderately alkaline.

The thickness of the solum ranges from 45 to 60 inches. The depth to the natric horizon ranges from 5 to 30 inches.

The A horizon has value of 3 or 4 and chroma of 2 through 4. The Bt horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 through 4. It generally is neutral to moderately alkaline. In uneroded pedons, however, it is strongly acid in the upper part. It is silty clay loam, clay loam, loam, or silt loam. The content of clay in this horizon ranges from 27 to 35 percent.

Haymond Series

The Haymond series consists of well drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slope ranges from 0 to 2 percent.

Haymond soils commonly are adjacent to Hickory, Huntsville, Lawson, and Wakeland soils. Hickory soils formed in glacial till on side slopes above the Haymond soils. Huntsville soils have a mollic epipedon. They are on natural levees. The somewhat poorly drained Lawson and Wakeland soils are lower on the landscape than the Haymond soils. Also, Lawson soils are cumulic.

Typical pedon of Haymond silt loam, 1,020 feet north and 690 feet west of the center of sec. 32, T. 6 N., R. 4 W.

Ap—0 to 10 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; neutral; clear smooth boundary.

C1—10 to 24 inches; brown (10YR 4/3) silt loam; weak fine and medium subangular blocky structure; friable; common very thin very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

C2—24 to 47 inches; brown (10YR 4/3) silt loam; very thin strata of pale brown (10YR 6/3) silt loam and very fine sand; weak fine and medium subangular blocky structure; friable; neutral; gradual smooth boundary.

Ab—47 to 60 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine subangular blocky structure; friable; neutral.

The Ap horizon is 7 to 11 inches thick. It has value of 3 or 4 and chroma of 2 through 4. The C horizon has value of 4 or 5 and chroma of 3 or 4. The content of clay in the control section is less than 18 percent. Reaction is slightly acid or neutral throughout the profile.

Herrick Series

The Herrick series consists of somewhat poorly drained, moderately slowly permeable soils on till plains. These soils formed in loess. Slope ranges from 0 to 2 percent.

Herrick soils are similar to Oconee soils and commonly are adjacent to Douglas, Ebbert, Piasa, and Virden soils. The well drained Douglas soils are on ridges above the Herrick soils. The poorly drained Ebbert and Virden soils are slightly lower on the till plains than the Herrick soils. Oconee soils do not have a mollic epipedon. Piasa soils have a natric horizon. They occur as areas closely intermingled with areas of the Herrick soils.

Typical pedon of Herrick silt loam, 1,220 feet north and 225 feet east of the southwest corner of sec. 30, T. 4 N., R. 4 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—9 to 13 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; many thin very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; abrupt smooth boundary.

E—13 to 18 inches; dark grayish brown (10YR 4/2) silt loam; common medium very dark grayish brown (10YR 3/2) aggregates from the A horizon; few fine distinct yellowish brown (10YR 5/6) mottles; weak coarse platy structure parting to moderate fine and medium subangular blocky; friable; continuous thin gray (10YR 6/1) silt coatings on faces of peds; few medium rounded accumulations (iron and manganese oxide); medium acid; abrupt smooth boundary.

Btg1—18 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; common fine and medium faint yellowish brown (10YR 5/6 and 5/8) and few fine distinct grayish brown (10YR 5/2) mottles; weak fine prismatic structure parting to moderate fine and medium angular blocky; firm; continuous moderately thick dark grayish brown (10YR 4/2) clay films on faces of peds and black (10YR 2/1) and very dark gray (10YR 3/1) organic coatings in pores and root channels; few fine irregular accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

Btg2—28 to 35 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate fine and medium angular blocky; firm; nearly continuous dark grayish brown (10YR 4/2) clay films on faces of peds and few thick black (10YR 2/1) organic coatings in pores; few fine and medium rounded accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

Btg3—35 to 41 inches; grayish brown (2.5Y 5/2) silty clay loam; many fine and medium prominent yellowish brown (10YR 5/6 and 5/8) mottles; moderate medium prismatic structure; firm; common thin dark grayish brown (10YR 4/2) clay films on faces of peds and few thin black (10YR 2/1) organic coatings in pores; few fine irregular accumulations (iron and manganese oxide); slightly acid; clear smooth boundary.

Btg4—41 to 48 inches; grayish brown (2.5Y 5/2) silty clay loam; many fine and medium prominent strong brown (7.5YR 4/6) and yellowish brown (10YR 5/8) mottles; weak medium prismatic structure; firm; few thin dark gray (10YR 4/1) clay films on faces of peds and very dark grayish brown (10YR 3/2) clay films in pores; few medium and coarse irregular accumulations (iron and manganese oxide); slightly acid; gradual smooth boundary.

BCg—48 to 60 inches; light olive gray (5Y 6/2) silty clay loam; common medium prominent strong brown (7.5YR 5/8) mottles; very weak medium prismatic structure; friable; few very thin dark gray (10YR 4/1) clay films on faces of peds and few thin very dark grayish brown (10YR 3/2) clay films in pores; common medium and coarse irregular accumulations (iron and manganese oxide); slightly acid.

The thickness of the solum ranges from 40 to 65 inches. The mollic epipedon is 10 to 13 inches thick.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The E horizon has value of 3 or 4 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 2 through 6. It is slightly acid to strongly acid. It is silty clay or silty clay loam. The content of clay in this horizon ranges from 35 to 42 percent.

Hickory Series

The Hickory series consists of well drained, moderately permeable soils on side slopes along drainageways in the uplands. These soils formed in glacial till. Slope ranges from 15 to 30 percent.

Hickory soils are similar to Negley soils and commonly are adjacent to Ava, Hosmer, and Wakeland soils. The moderately well drained Ava and Hosmer soils are on ridges above the Hickory soils. Also, Ava soils have a fragipan, and Hosmer soils formed in loess and contain less sand and more silt than the Hickory soils. Negley soils contain more sand than the Hickory soils and have a higher content of coarse fragments. Their positions on the landscape are similar to those of the Hickory soils. The somewhat poorly drained Wakeland soils formed in silty alluvium on bottom land.

Typical pedon of Hickory silt loam, 15 to 30 percent slopes, about 8 miles north and 0.5 mile west of Greenville; 792 feet west and 38 feet north of the southeast corner of sec. 28, T. 7 N., R. 3 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak fine crumb structure; friable; very strongly acid; clear smooth boundary.

E—4 to 12 inches; light yellowish brown (10YR 6/4) silt loam, very pale brown (10YR 7/4) dry; weak very coarse platy structure parting to weak fine crumb; friable; strongly acid; clear smooth boundary.

Bt1—12 to 17 inches; yellowish brown (10YR 5/6) clay loam; moderate fine subangular blocky structure; firm; common moderately thick brown (10YR 4/3) clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt2—17 to 26 inches; dark yellowish brown (10YR 4/6) clay loam; moderate medium subangular blocky structure; firm; common moderately thick brown (10YR 5/3) clay films on faces of peds; few small pebbles; very strongly acid; gradual smooth boundary.

Bt3—26 to 35 inches; yellowish brown (10YR 5/4) clay loam; many coarse and medium distinct strong brown (7.5YR 5/8) and brownish yellow (10YR 6/8) mottles; moderate coarse and medium angular blocky structure; very firm; many moderately thick dark yellowish brown (10YR 4/4) clay films on faces of peds; small pebbles surrounded by thick clay films; very strongly acid; gradual smooth boundary.

Bt4—35 to 46 inches; pale brown (10YR 6/3) clay loam; many coarse prominent strong brown (7.5YR 5/6) mottles; weak medium and coarse prismatic structure parting to weak coarse blocky; very firm; few black (10YR 2/1) concretions (iron and manganese oxide); few rocks about 1 inch in diameter; strongly acid; diffuse smooth boundary.

C—46 to 60 inches; light yellowish brown (10YR 6/4) loam; common medium distinct dark yellowish brown (10YR 4/6) mottles; massive; firm; few small black (10YR 2/1) concretions (iron and manganese oxide); neutral.

The thickness of the solum ranges from 40 to 65 inches. In some pedons as much as 16 inches of loess overlies the glacial till.

The A horizon has value of 3 or 4. The Ap horizon has value of 4 or 5 and chroma of 2 or 3. It is silt loam, clay loam, or loam. The E horizon has value of 4 through 6 and chroma of 2 through 4. The Bt horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 3 through 6. It is medium acid to very strongly acid in the upper part and strongly acid to neutral in the lower part. The content of clay in this horizon ranges from 27 to 35 percent and the content of sand from 15 to 45 percent.

Hosmer Series

The Hosmer series consists of moderately well drained soils on convex ridgetops and side slopes in the uplands. These soils are moderately permeable in the upper part and very slowly permeable in the lower part. They formed in loess. Slope ranges from 2 to 10 percent.

Hosmer soils are similar to Ava soils and commonly are adjacent to Hickory, Marine, Parke, and Stoy soils. Ava soils formed in a layer of loess thinner than that in which the Hosmer soils formed. Hickory and Parke soils are well drained. They do not have a fragipan. Hickory soils formed in glacial till on side slopes along drainageways, and Parke soils are on the higher ridgetops. Marine and Stoy soils are somewhat poorly drained and are on broad ridges below the Hosmer soils. They do not have a fragipan. Also, Marine soils are characterized by an abrupt textural change between the E and B horizons.

Typical pedon of Hosmer silt loam, 2 to 5 percent slopes, 1,670 feet south and 50 feet east of the center of sec. 26, T. 7 N., R. 4 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; medium acid; abrupt smooth boundary.

E—7 to 10 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; medium acid; abrupt smooth boundary.

EB—10 to 17 inches; brownish yellow (10YR 6/6) silt loam; moderate fine subangular blocky structure; firm; strongly acid; clear smooth boundary.

Bt—17 to 22 inches; yellowish brown (10YR 5/6) silty clay loam; strong fine and medium angular blocky structure; firm; discontinuous thin silt coatings, which are not evident when wet; very strongly acid; clear smooth boundary.

B/E—22 to 27 inches; dark yellowish brown (10YR 4/4) silty clay loam (Bt); many fine distinct light brownish gray (10YR 6/2) mottles; weak fine and medium prismatic structure parting to strong medium angular blocky; firm; continuous thick light gray (10YR 7/1) silt coatings on faces of peds and in pores (E); very strongly acid; abrupt smooth boundary.

B't—27 to 32 inches; dark yellowish brown (10YR 4/4) silty clay loam; many fine and medium distinct light brownish gray (10YR 6/2) and common fine and medium distinct dark brown (7.5YR 4/4) mottles; strong medium prismatic structure parting to strong medium and coarse angular blocky; firm; continuous moderately thick dark brown (10YR 4/3) clay films on faces of peds; very strongly acid; gradual smooth boundary.

Btx—32 to 39 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct light

brownish gray (10YR 6/2) mottles; weak medium prismatic structure parting to moderate medium and coarse angular blocky; firm; slightly brittle; many moderately thick dark brown (10YR 4/3) clay films on vertical faces of peds; very strongly acid; gradual smooth boundary.

Bx—39 to 49 inches; dark yellowish brown (10YR 4/4) silt loam; many coarse distinct light brownish gray (10YR 6/2) mottles; weak very coarse prismatic structure; firm; brittle; black (10YR 2/1) and very dark brown (10YR 2/2) patchy stains (iron and manganese oxide) 1 millimeter in size; very strongly acid; diffuse smooth boundary.

BC—49 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; many fine and medium distinct brown (7.5YR 5/2) mottles; weak very coarse subangular blocky structure; firm; few small pebbles; very strongly acid.

The thickness of the solum ranges from 50 to 70 inches. The depth to the fragipan ranges from 20 to 40 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 through 4. It is dominantly silt loam, but in some pedons it is silty clay loam. The E horizon has value of 4 or 5 and chroma of 2 through 4. Some eroded pedons do not have an E horizon. The Bt horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 3 through 6. It is strongly acid or very strongly acid. It is silt loam or silty clay loam. The content of clay in this horizon ranges from 27 to 35 percent. The Bx horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 3 through 8. It is firm or very firm silt loam or silty clay loam. It is medium acid to very strongly acid.

Hoyleton Series

The Hoyleton series consists of somewhat poorly drained, slowly permeable soils on broad ridges, side slopes, and till plains in the uplands. These soils formed in loess over Illinoian till. Slope ranges from 0 to 5 percent.

Hoyleton soils are similar to Oconee soils and commonly are adjacent to Cisne, Darmstadt, Huey, and Richview soils. The poorly drained Cisne soils are on the lower parts of the till plains. Darmstadt and Huey soils have a natric horizon. The poorly drained Darmstadt soils occur as areas closely intermingled with areas of the Hoyleton soils on the broad ridges, and Huey soils are on broad flats below the Hoyleton soils. Oconee soils formed in a layer of loess thicker than that in which the Hoyleton soils formed. The moderately well drained Richview soils are on ridges above the Hoyleton soils.

Typical pedon of Hoyleton silt loam, 2 to 5 percent slopes, eroded, 2,690 feet south and 1,651 feet east of the northwest corner of sec. 12, T. 4 N., R. 2 W.

Ap—0 to 7 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak fine granular structure; friable; neutral; abrupt smooth boundary.

Bt1—7 to 11 inches; brown (10YR 5/3) silty clay loam; many fine prominent yellowish red (5YR 4/6) mottles; strong fine and very fine subangular blocky structure; firm; strongly acid; clear smooth boundary.

Bt2—11 to 15 inches; brown (10YR 5/3) silty clay loam; many fine and medium prominent strong brown (7.5YR 5/6 and 5/8) mottles; strong fine prismatic structure parting to strong fine subangular blocky; firm; many moderately thick brown (10YR 5/3) silt coatings on faces of peds; strongly acid; abrupt smooth boundary.

Bt3—15 to 23 inches; brown (10YR 5/3) silty clay; many fine and medium prominent yellowish red (5YR 5/8) and common fine distinct light brownish gray (10YR 6/2) mottles; strong medium prismatic structure parting to strong medium angular blocky; very firm; many moderately thick dark reddish brown (5YR 3/3) clay films on prisms and many thick very dark gray (5YR 3/1) clay films on angular blocks; very strongly acid; clear smooth boundary.

Bt4—23 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; many medium and coarse distinct dark yellowish brown (10YR 4/4) mottles; moderate medium prismatic structure parting to weak coarse and medium angular blocky; firm; discontinuous thin dark reddish brown (5YR 3/3) clay films on faces of peds; few black (10YR 2/1) accumulations (iron and manganese oxide); very strongly acid; clear smooth boundary.

Bt5—28 to 33 inches; brown (7.5YR 5/2) silty clay loam; many medium and coarse distinct dark brown (7.5YR 4/4) mottles; weak coarse prismatic structure; firm; few small pebbles; strongly acid; gradual smooth boundary.

2BC—33 to 41 inches; dark brown (7.5YR 4/4) silt loam; common coarse distinct light brown (7.5YR 6/4) mottles; weak coarse prismatic structure; firm; about 20 percent sand; slightly acid; gradual smooth boundary.

2C—41 to 60 inches; dark brown (7.5YR 4/4) silt loam; massive; firm; slightly acid.

The thickness of the solum ranges from 36 to 60 inches. The thickness of the loess ranges from 30 to 45 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 through 3. The E horizon, if it occurs, has value of 4 through 6 and chroma of 3 or 4. Many eroded pedons do not have an E horizon. The Bt horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 2 through 4 and has mottles with hue of 5YR to 2.5Y. It is extremely acid to strongly acid. It is silty clay loam or silty clay. The content of clay in this horizon ranges from

35 to 45 percent. The 2B and 2C horizons are silt loam, loam, or clay loam.

Huey Series

The Huey series consists of poorly drained, very slowly permeable soils on broad upland plains. These soils formed in loess over Illinoian till. Slope ranges from 0 to 2 percent.

Huey soils are similar to Darmstadt soils and commonly are adjacent to Cisne, Darmstadt, Hoyleton, and Tamalco soils. Cisne and Hoyleton soils do not have a natric horizon. Cisne soils occur as areas closely intermingled with areas of the Huey soils. Darmstadt and Hoyleton soils are somewhat poorly drained and are slightly higher on the till plains than the Huey soils. Tamalco soils are moderately well drained and are on ridges above the Huey soils.

Typical pedon of Huey silt loam, about 9 miles south and 3 miles east of Greenville; 1,320 feet west and 1,465 feet south of the northeast corner of sec. 30, T. 4 N., R. 2 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; neutral; abrupt smooth boundary.

E—7 to 13 inches; grayish brown (10YR 5/2) silt loam; moderate coarse platy structure; friable; mildly alkaline; abrupt smooth boundary.

Btng1—13 to 22 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine and medium strong brown (7.5YR 5/6) mottles; strong fine and medium prismatic structure parting to moderate medium angular blocky; firm; discontinuous moderately thick dark gray (10YR 4/1) clay films on faces of peds; moderately alkaline; gradual smooth boundary.

Btng2—22 to 30 inches; light brownish gray (2.5Y 6/2) silty clay loam; many fine prominent dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/8) mottles; strong coarse prismatic structure parting to weak coarse angular blocky; very firm; continuous thick dark gray (10YR 4/1) clay films on faces of peds; moderately alkaline; gradual smooth boundary.

BCng—30 to 42 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium and coarse prominent strong brown (7.5YR 5/6) mottles; weak very coarse prismatic structure; firm; common small calcium carbonate concretions and small concretions (iron and manganese oxide); moderately alkaline; diffuse smooth boundary.

Cng1—42 to 55 inches; gray (10YR 6/1) silt loam; many medium and coarse distinct dark yellowish brown (10YR 4/6) and brownish yellow (10YR 6/6) mottles; massive; friable; moderately alkaline; clear smooth boundary.

2Cng2—55 to 60 inches; gray (10YR 5/1) silt loam; many medium and coarse prominent brown (7.5YR 4/4) and dark brown (7.5YR 3/2) mottles; massive; friable; moderately alkaline.

The thickness of the solum ranges from 36 to 60 inches. The thickness of the A horizon combined with that of the E horizon ranges from 6 to 16 inches. The thickness of the loess ranges from 50 to more than 60 inches. The depth to the natric horizon ranges from 10 to 20 inches.

The Ap horizon has value of 4 or 5 and chroma of 1 or 2. The E horizon has value of 5 through 7. The Bt horizon has hue of 10YR through 5Y, value of 5 or 6, and chroma of 1 or 2 and has mottles with higher chroma. It is medium acid to strongly alkaline. The content of clay in this horizon ranges from 27 to 35 percent. The C horizon is loam, silt loam, or clay loam.

Huntsville Series

The Huntsville series consists of moderately well drained, moderately permeable soils on flood plains along narrow streams and on natural levees on bottom land. These soils formed in silty alluvium. Slope ranges from 0 to 5 percent.

Huntsville soils are similar to Haymond soils and commonly are adjacent to Birds, Tice, and Wakeland soils. The poorly drained Birds and somewhat poorly drained Tice and Wakeland soils are lower on the landscape than the Huntsville soils. Also, Tice soils contain more clay. Birds, Haymond, and Wakeland soils do not have a mollic epipedon and are more stratified than the Huntsville soils.

Typical pedon of Huntsville silt loam, 0 to 3 percent slopes, 80 feet south and 99 feet east of the northwest corner of sec. 23, T. 5 N., R. 4 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, brown (10YR 5/3) dry; weak fine and medium granular structure; friable; neutral; clear smooth boundary.

A1—8 to 18 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; dominantly weak medium granular structure but platy in the upper part; friable; neutral; clear smooth boundary.

A2—18 to 26 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak medium granular structure grading to weak fine subangular blocky in the lower part; friable; continuous thin very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.

AC—26 to 36 inches; brown (10YR 4/3) silt loam; common medium distinct dark yellowish brown (10YR 4/6) mottles below a depth of 30 inches; weak medium subangular blocky structure; very friable; common thin very dark grayish brown (10YR 3/2) and dark brown (10YR 3/3) organic coatings on faces of peds; neutral; gradual smooth boundary.

C1—36 to 43 inches; dark yellowish brown (10YR 4/4) silt loam; thin light brownish gray (10YR 6/2) strata; common medium distinct brown (10YR 5/3) mottles; massive; very friable; neutral; gradual smooth boundary.

C2—43 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; thin light brownish gray (10YR 6/2) strata; common fine distinct pale brown (10YR 6/3) and common medium distinct yellowish brown (10YR 5/6) mottles; massive; very friable; neutral.

The A horizon is 24 to 40 inches thick. It has value of 2 or 3 and chroma of 1 through 3. It has weak or moderate, granular or blocky structure. The content of clay in the control section ranges from 19 to 24 percent. The C horizon has value of 4 or 5 and chroma of 3 or 4.

Huntsville loam, 1 to 5 percent slopes, contains more sand in the control section than is described as the range for the series. This difference, however, does not alter the usefulness or behavior of the soil.

Kendall Series

The Kendall series consists of somewhat poorly drained, moderately permeable soils on terraces. These soils formed in silty material and in the underlying stratified outwash. Slope ranges from 1 to 5 percent.

Kendall soils are similar to Creal soils and commonly are adjacent to Birds and Hickory soils. Birds soils are poorly drained and formed in alluvium on bottom land. Creal soils formed in loess or silty alluvium on foot slopes. Hickory soils are well drained and are on side slopes in the uplands.

Typical pedon of Kendall silt loam, 1 to 5 percent slopes, 670 feet south and 795 feet east of the northwest corner of sec. 24, T. 5 N., R. 4 W.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; very friable; slightly acid; abrupt smooth boundary.

Eg—7 to 12 inches; light brownish gray (10YR 6/2) silt loam, white (10YR 8/2) dry; common fine faint pale brown (10YR 6/3) and common fine distinct yellowish brown (10YR 5/8) mottles; weak thick platy structure; friable; common fine rounded dark brown (7.5YR 3/2) accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

BE—12 to 16 inches; brown (10YR 4/3) silty clay loam; common medium faint dark yellowish brown (10YR 4/4) and common medium distinct light brownish gray (2.5Y 6/2) mottles; moderate fine and medium subangular blocky structure; firm; continuous thin grayish brown (10YR 5/2) clay films on faces of peds; continuous moderately thick light brownish gray (10YR 6/2) silt coatings on faces of peds; strongly acid; clear smooth boundary.

Btg1—16 to 24 inches; brown (10YR 5/3) silty clay loam; common coarse distinct strong brown (7.5YR 5/6) and common medium distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; firm; continuous moderately thick grayish brown (10YR 5/2) clay films on faces of peds; few medium rounded dark brown (7.5YR 3/2) accumulations (iron and manganese oxide); strongly acid; gradual smooth boundary.

Btg2—24 to 33 inches; light brownish gray (10YR 6/2) silty clay loam; common coarse prominent yellowish red (5YR 5/6) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; continuous moderately thick grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded dark brown (7.5YR 3/2) accumulations (iron and manganese oxide); strongly acid; clear smooth boundary.

Btg3—33 to 41 inches; light brownish gray (2.5Y 6/2) silty clay loam; many coarse prominent strong brown (7.5YR 5/6) and common fine distinct light olive brown (2.5Y 5/6) mottles; moderate medium and coarse subangular blocky structure; firm; continuous thin grayish brown (10YR 5/2) clay films on faces of peds; common fine irregular dark reddish brown (5YR 3/3) accumulations (iron and manganese oxide); strongly acid; clear smooth boundary.

2BCg—41 to 50 inches; pale brown (10YR 6/3) silt loam; common coarse distinct strong brown (7.5YR 5/8) and common medium faint light brownish gray (2.5Y 6/2) mottles; weak coarse subangular blocky structure; firm; common thin brown (10YR 5/3) and grayish brown (10YR 5/2) clay films on faces of peds; few medium irregular dark reddish brown (5YR 3/3) accumulations (iron and manganese oxide); about 10 percent sand by volume; medium acid; clear smooth boundary.

2Cg—50 to 60 inches; light brownish gray (10YR 6/2) silt loam; many coarse distinct strong brown (7.5YR 5/6) mottles; massive; firm; common fine irregular dark brown (7.5YR 3/2) accumulations (iron and manganese oxide); about 15 percent sand by volume; slightly acid.

The thickness of the solum ranges from 48 to 60 inches. The depth to the stratified outwash ranges from 40 to 60 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The E horizon has value of 5 or 6. The Bt horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 2 through 4. It is medium acid to very strongly acid. The content of clay in this horizon ranges from 27 to 35 percent. The 2C horizon is dominantly loam or silt loam but commonly has strata of other textures.

Lawson Series

The Lawson series consists of somewhat poorly drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slope ranges from 0 to 2 percent.

Lawson soils are similar to Huntsville soils and commonly are adjacent to Beaucoup, Hickory, and Huntsville soils. The poorly drained Beaucoup soils are in depressions. They contain more clay than the Lawson soils. The well drained Hickory soils formed in glacial till on side slopes in the uplands. The moderately well drained Huntsville soils are on foot slopes.

Typical pedon of Lawson silt loam, about 6 miles north of Greenville; 2,244 feet south and 528 feet west of the northeast corner of sec. 10, T. 6 N., R. 3 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; neutral; abrupt smooth boundary.

A1—9 to 16 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak medium and coarse subangular blocky structure; friable; neutral; clear smooth boundary.

A2—16 to 28 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak coarse subangular blocky structure; friable; neutral; clear smooth boundary.

C1—28 to 34 inches; dark grayish brown (10YR 4/2) silt loam; few fine faint dark brown (10YR 3/3) mottles; massive; friable; neutral; gradual smooth boundary.

C2—34 to 60 inches; mottled grayish brown (10YR 5/2), dark grayish brown (10YR 4/2), and dark yellowish brown (10YR 4/6) silt loam; massive; friable; neutral.

The thickness of the mollic epipedon ranges from 24 to 36 inches. The A horizon has value of 2 or 3 and chroma of 1 or 2. The C horizon has hue of 10YR or 2.5Y, value of 3 through 6, and chroma of 2 or 3. The content of clay in the control section ranges from 18 to 27 percent. Reaction is slightly acid to mildly alkaline throughout the profile.

Marine Series

The Marine series consists of somewhat poorly drained, slowly permeable soils on broad ridges and plains in the uplands. These soils formed in loess. Slope ranges from 0 to 4 percent.

Marine soils are similar to Bluford soils and commonly are adjacent to Hickory, Hosmer, and Rushville soils. Bluford soils contain more sand in the lower part of the solum than the Marine soils. Also, they formed in a thinner layer of loess. Hickory soils are well drained and are on side slopes along drainageways. They are fine-loamy. Hosmer soils are moderately well drained and are on the higher ridges. They have a fragipan. Rushville soils are poorly drained and are on the slightly lower plains and in depressions.

Typical pedon of Marine silt loam, 2 to 4 percent slopes, 1,440 feet east and 440 feet north of the southwest corner of sec. 27, T. 5 N., R. 4 W.

Ap—0 to 7 inches; brown (10YR 5/3) silt loam, very pale brown (10YR 7/3) dry; weak fine granular structure; very friable; common fine rounded accumulations (iron and manganese oxide); neutral; abrupt smooth boundary.

E1—7 to 12 inches; light gray (10YR 7/2) silt loam; common fine and medium distinct brown (10YR 5/3) and yellowish brown (10YR 5/4) mottles; weak thin platy structure parting to weak fine granular; very friable; many fine rounded accumulations (iron and manganese oxide); very strongly acid; clear smooth boundary.

E2—12 to 16 inches; light gray (10YR 7/2) silt loam; few medium distinct yellowish brown (10YR 5/4) and common medium distinct brown (10YR 5/3) mottles; moderate thick platy structure and some moderate fine subangular blocky; friable; very strongly acid; clear smooth boundary.

Btg1—16 to 24 inches; yellowish brown (10YR 5/4) silty clay loam; few medium distinct yellowish brown (10YR 5/6 and 5/8) mottles; weak medium subangular blocky structure; very firm; thick continuous dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations (iron and manganese oxide); very strongly acid; clear smooth boundary.

Btg2—24 to 30 inches; grayish brown (2.5Y 5/2) silty clay loam; many fine and medium distinct yellowish brown (10YR 5/6 and 5/8) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; very firm; continuous thick grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded accumulations (iron and manganese oxide); strongly acid; clear smooth boundary.

Btg3—30 to 49 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent strong brown (7.5YR 5/8) and reddish yellow (7.5YR 6/8) mottles; moderate medium prismatic structure; firm; continuous moderately thick dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine rounded accumulations (iron and manganese oxide); strongly acid; clear smooth boundary.

Btg4—49 to 52 inches; grayish brown (10YR 5/2) silty clay loam; many coarse and medium distinct strong brown (7.5YR 5/8 and 5/6) mottles; moderate medium prismatic structure; firm; continuous thin grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations (iron and manganese oxide); strongly acid; gradual smooth boundary.

BCg—52 to 60 inches; light brownish gray (10YR 6/2) silty clay loam; few medium distinct strong brown (7.5YR 5/8) and yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; firm; many very thin grayish brown (2.5Y 5/2) clay films on faces of peds; common medium rounded accumulations (iron and manganese oxide); medium acid.

The thickness of the solum ranges from 50 to more than 60 inches. The A horizon is 12 to 16 inches thick. It has value of 4 or 5 and chroma of 2 or 3. The E horizon has value of 5 through 7 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 2 through 4. It is medium acid to very strongly acid. It is silty clay loam or silty clay. The content of clay increases abruptly from the albic horizon to the argillic horizon. It ranges from 35 to 42 percent in the Bt horizon.

Martinsville Series

The Martinsville series consists of well drained, moderately permeable soils on the sides of terraces. These soils formed in loess and in the underlying outwash. Slope ranges from 5 to 10 percent.

Martinsville soils are similar to Hickory soils and commonly are adjacent to Beaucoup, Kendall, and Wakeland soils. Beaucoup soils are poorly drained and are on bottom land. They have a mollic epipedon and contain less sand in the solum than the Martinsville soils. Hickory soils formed in glacial till. They are not stratified in the lower part of the solum. Kendall soils are somewhat poorly drained and are higher on the landscape than the Martinsville soils. Also, they are deeper to glacial outwash. Wakeland soils are somewhat poorly drained and are on bottom land. They contain less sand in the solum than the Martinsville soils.

Typical pedon of Martinsville silt loam, 5 to 10 percent slopes, severely eroded, 792 feet north and 840 feet west of the center of sec. 28, T. 6 N., R. 4 W.

Ap—0 to 6 inches; dark yellowish brown (10YR 4/4) silt loam, yellowish brown (10YR 5/6) dry; moderate medium granular structure; friable; neutral; clear smooth boundary.

Bt1—6 to 10 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; continuous thin brown (7.5YR 4/4) clay films on faces of peds; medium acid; clear smooth boundary.

2Bt2—10 to 26 inches; strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; firm; continuous thin reddish brown (5YR 4/4) clay films on faces of peds; medium acid; clear smooth boundary.

2Bt3—26 to 41 inches; strong brown (7.5YR 5/6) clay loam; weak coarse subangular blocky structure; friable; continuous thin yellowish red (5YR 4/6) clay films on faces of peds; medium acid; clear smooth boundary.

2BC—41 to 50 inches; strong brown (7.5YR 5/6) loam; weak coarse subangular blocky structure; friable; medium acid; clear smooth boundary.

2C—50 to 60 inches; strong brown (7.5YR 5/6) sandy loam; massive; friable; medium acid.

The thickness of the solum ranges from 45 to 60 inches. The Ap horizon has value of 4 or 5 and chroma of 3 or 4. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 through 6. It is slightly acid to strongly acid. It is clay loam, silty clay loam, loam, or sandy clay loam. The content of clay in the argillic horizon ranges from 20 to 30 percent. The BC horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 through 6.

Negley Series

The Negley series consists of well drained, moderately permeable soils on side slopes in the uplands. These soils formed in glacial drift. Slope ranges from 10 to 15 percent.

Negley soils are similar to Hickory soils and commonly are adjacent to Hickory, Hosmer, Parke, and Richview soils. Hickory soils contain less sand than the Negley soils and have a lower content of coarse fragments. They are on side slopes along drainageways. The moderately well drained Hosmer soils are on ridges above the Negley soils. They have a fragipan. Parke and Richview soils formed in loess and in the underlying glacial drift. They are on ridgetops and side slopes.

Typical pedon of Negley silt loam, 10 to 15 percent slopes, 550 feet north and 130 feet east of the southwest corner of sec. 27, T. 6 N., R. 3 W.

Ap—0 to 8 inches; dark brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine angular blocky structure parting to moderate medium and coarse granular; firm; neutral; abrupt smooth boundary.

E—8 to 10 inches; yellowish brown (10YR 5/4) silt loam; moderate coarse and very coarse platy structure; friable; continuous thick dark grayish brown (10YR 4/2) silt coatings on horizontal faces of peds; neutral; clear smooth boundary.

Bw—10 to 18 inches; dark brown (7.5YR 4/4) clay loam; weak medium subangular blocky structure; firm; slightly acid; gradual smooth boundary.

Bt1—18 to 36 inches; yellowish red (5YR 4/6) clay loam; strong coarse subangular blocky structure; firm; common moderately thick dark reddish brown (5YR 3/4) clay films on vertical faces of peds; about 15 percent glacial pebbles; strongly acid; diffuse smooth boundary.

Bt2—36 to 55 inches; reddish brown (5YR 4/4) clay loam; moderate coarse subangular blocky structure; firm; common thick brown (7.5YR 5/4) clay films on vertical faces of peds; about 15 percent glacial pebbles; medium acid; diffuse smooth boundary.

BC—55 to 70 inches; yellowish red (5YR 5/8) sandy clay loam; weak coarse subangular blocky structure; firm; common moderately thick dark brown (7.5YR 4/4) clay films in root channels and pores; about 15 percent glacial pebbles; medium acid.

The thickness of the solum and the depth to carbonates are more than 80 inches. The Ap horizon has hue of 10YR or 7.5YR, value of 3 through 5, and chroma of 2 through 4. It is dominantly silt loam, but in some pedons it is gravelly loam. The E horizon has value of 5 or 6 and chroma of 3 or 4. Some pedons do not have an E horizon. The Bt horizon has hue of 10YR through 5YR, value of 4 or 5, and chroma of 3 through 6. It is medium acid to very strongly acid. It is clay loam or sandy clay loam. The content of clay in this horizon ranges from 20 to 35 percent.

Newberry Series

The Newberry series consists of poorly drained, slowly permeable soils on broad plains and in depressions on uplands. These soils formed in loess over Illinoian till. Slope ranges from 0 to 2 percent.

Newberry soils are similar to Cisne soils and commonly are adjacent to Cisne, Ebbert, and Huey soils. Cisne soils are characterized by an abrupt textural change between the E and B horizons. They contain more clay in the Bt horizon than the Newberry soils. Also, they are slightly higher on the landscape. Ebbert soils have a mollic epipedon. They are in depressions slightly below the Newberry soils. Huey soils have a natric horizon. They are on plains slightly above the Newberry soils.

Typical pedon of Newberry silt loam, about 0.75 mile east of Hookdale; 50 feet north and 750 feet west of the southeast corner of sec. 34, T. 5 N., R. 2 W.

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; medium acid; abrupt smooth boundary.

E1—6 to 12 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; few fine distinct dark yellowish brown (10YR 4/4) mottles; weak fine granular structure; friable; very strongly acid; clear smooth boundary.

E2—12 to 19 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; common fine distinct dark yellowish brown (10YR 4/6) mottles; weak fine granular structure; friable; very strongly acid; clear smooth boundary.

Btg1—19 to 25 inches; dark grayish brown (10YR 4/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm; continuous thin very dark grayish brown (10YR 3/2) clay films on vertical faces of peds; very strongly acid; gradual smooth boundary.

Btg2—25 to 32 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; many thick grayish brown (10YR 5/2) clay films on faces of peds; very strongly acid; clear smooth boundary.

Btg3—32 to 43 inches; dark grayish brown (10YR 4/2) silty clay loam; few fine distinct dark yellowish brown (10YR 4/4) mottles; moderate medium and fine subangular blocky structure; firm; continuous thin dark grayish brown (10YR 4/2) clay films on faces of peds; few black (10YR 2/1) stains (iron and manganese oxide); very strongly acid; clear smooth boundary.

2Btg4—43 to 52 inches; grayish brown (10YR 5/2) silty clay loam; common fine and medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; common thin dark gray (10YR 4/1) clay films on faces of peds; few small pebbles and coarse sand grains; very strongly acid; clear smooth boundary.

2Cg—52 to 60 inches; dark grayish brown (10YR 4/2) silty clay loam; few medium distinct dark yellowish brown (10YR 3/6) mottles; massive; firm; noticeable increase in content of coarse sand; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The Ap horizon is 6 to 9 inches thick. It has value of 2 or 3 and chroma of 1 or 2. The E horizon has value of 4 through 6 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 or 2 and has mottles with higher chroma. It is very strongly acid to medium acid. The content of clay in this horizon ranges from 27 to 35 percent. The 2C horizon is silty clay loam or clay loam.

Oconee Series

The Oconee series consists of somewhat poorly drained, slowly permeable soils on ridges in the uplands. These soils formed in loess. Slope ranges from 0 to 5 percent.

Oconee soils are similar to Herrick soils and commonly are adjacent to Cowden, Darmstadt, Douglas, and Marine soils. The poorly drained Cowden soils are on broad upland plains. They are characterized by an abrupt textural change between the E and B horizons. Darmstadt soils have a natric horizon and contain less clay than the Oconee soils. They commonly occur as

areas closely intermingled with areas of the Oconee soils. Douglas soils are well drained and are on the higher ridges. Herrick soils have a mollic epipedon. Marine soils are characterized by an abrupt textural change between the E and B horizons. They are closer to drainageways than the Oconee soils.

Typical pedon of Oconee silt loam, 0 to 2 percent slopes, 1,420 feet south and 380 feet west of the northeast corner of sec. 33, T. 4 N., R. 4 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; neutral; clear smooth boundary.

E—9 to 14 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; common fine faint yellowish brown (10YR 5/4) mottles; weak fine granular structure; friable; common moderately thick very dark grayish brown (10YR 3/2) organic coatings in pores; common fine irregular accumulations (iron and manganese oxide); slightly acid; clear smooth boundary.

Btg1—14 to 23 inches; yellowish brown (10YR 5/4) silty clay; common fine and medium distinct strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; continuous moderately thick dark grayish brown (10YR 4/2) clay films on faces of peds; common very fine irregular accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

Btg2—23 to 31 inches; light brownish gray (10YR 6/2) silty clay loam; common fine and medium distinct strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; firm; continuous thin brown (10YR 5/3) and continuous moderately thick dark grayish brown (10YR 4/2) clay films on faces of peds; common fine irregular accumulations (iron and manganese oxide); medium acid; gradual smooth boundary.

Btg3—31 to 41 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent strong brown (7.5YR 4/6) mottles; weak coarse prismatic structure; firm; continuous thin dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

BCg—41 to 54 inches; light brownish gray (2.5Y 6/2) silt loam; common fine and medium distinct light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; firm; few thin grayish brown (10YR 5/2) clay films on faces of peds; few medium and coarse accumulations (iron and manganese oxide); slightly acid; clear smooth boundary.

Cg—54 to 70 inches; pinkish gray (7.5YR 6/2) silt loam; common coarse distinct strong brown (7.5YR 4/6) mottles; very weak coarse prismatic structure; friable; moderately alkaline.

The thickness of the solum ranges from 45 to 60 inches. The thickness of the A horizon combined with that of the E horizon ranges from 11 to 23 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The E horizon has value of 4 through 6 and chroma of 1 or 2. Some eroded pedons do not have an E horizon. The Bt horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 2 through 4. It is medium acid to very strongly acid. The content of clay in this horizon ranges from 35 to 42 percent. The C horizon ranges from medium acid to moderately alkaline.

Parke Series

The Parke series consists of well drained, moderately permeable soils on ridges and side slopes in the uplands. These soils formed in loess and in the underlying glacial drift. Slope ranges from 5 to 12 percent.

Parke soils are similar to Pike soils and commonly are adjacent to Ava, Negley, and Pike soils. The moderately well drained Ava soils are on the lower ridges. They have a fragipan. Negley soils formed in glacial drift on the steeper side slopes. Pike soils formed in a layer of loess thicker than that in which the Parke soils formed. They are on the less sloping ridges.

Typical pedon of Parke silt loam, 5 to 12 percent slopes, eroded, 1,155 feet east and 125 feet north of the southwest corner of sec. 24, T. 4 N., R. 2 W.

Ap—0 to 7 inches; dark brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; slightly acid; abrupt smooth boundary.

Bt1—7 to 17 inches; brown (7.5YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; continuous moderately thick dark brown (7.5YR 4/4) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—17 to 28 inches; brown (7.5YR 5/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; continuous moderately thick brown (7.5YR 4/4) clay films on faces of peds; strongly acid; clear smooth boundary.

2Bt3—28 to 39 inches; reddish brown (5YR 5/4) clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; many moderately thick reddish brown (5YR 4/4) clay films on faces of peds; strongly acid; clear smooth boundary.

2Bt4—39 to 47 inches; yellowish red (5YR 5/6) clay loam; weak coarse prismatic structure parting to

weak medium subangular blocky; friable; common thin reddish brown (5YR 4/4) clay films on faces of peds; strongly acid; clear smooth boundary.

2BC—47 to 60 inches; yellowish red (5YR 5/6) loam; weak coarse subangular blocky structure; friable; few thin yellowish red (5YR 4/6) clay films on faces of peds; strongly acid.

The solum is more than 65 inches thick. The thickness of the loess ranges from 20 to 40 inches.

The Ap horizon has value of 4 or 5 and chroma of 3 or 4. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 through 6. The 2Bt horizon has hue of 7.5YR through 2.5YR, value of 4 or 5, and chroma of 4 through 6. It is strongly acid or very strongly acid. It is clay loam or loam. The content of clay in this horizon ranges from 22 to 35 percent. The 2BC horizon is sandy clay loam, loam, or sandy loam.

Piasa Series

The Piasa series consists of poorly drained, very slowly permeable soils on broad uplands. These soils formed in loess. Slope ranges from 0 to 2 percent.

Piasa soils are similar to Ebbert soils and commonly are adjacent to Cowden, Ebbert, Herrick, and Virden soils. The similar and adjacent soils do not have a natric horizon. Cowden soils and the somewhat poorly drained Herrick soils occur as areas closely intermingled with areas of the Piasa soils on broad plains. Also, Cowden soils do not have a mollic epipedon. Ebbert soils are in depressions below the Piasa soils. Virden soils do not have an E horizon. They occur as areas closely intermingled with areas of the Piasa soils on the lower flats.

Typical pedon of Piasa silt loam, 40 feet south and 2,343 feet west of the northeast corner of sec. 19, T. 6 N., R. 3 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine granular structure; friable; neutral; abrupt smooth boundary.

En—8 to 11 inches; grayish brown (10YR 5/2) silt loam, light brownish gray (10YR 6/2) dry; moderate coarse platy structure parting to weak fine subangular blocky; friable; continuous very thick very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear irregular boundary.

Btng1—11 to 19 inches; dark grayish brown (2.5Y 4/2) silty clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; many grayish brown (10YR 5/2) silt coatings on faces of peds; many thick dark olive gray (5Y 3/2) clay films on faces of peds; moderately alkaline; gradual smooth boundary.

Btng2—19 to 29 inches; dark gray (5Y 4/1) silty clay; few fine prominent dark yellowish brown (10YR 4/4) mottles; weak coarse prismatic structure parting to weak coarse angular blocky; very firm; many thin dark gray (N 4/0) clay films on faces of peds; few small rounded calcium carbonate concretions; strongly alkaline; gradual smooth boundary.

Btng3—29 to 41 inches; gray (5Y 5/1) silty clay loam; common fine distinct dark yellowish brown (10YR 4/4) mottles; weak very coarse prismatic structure parting to weak very coarse angular blocky; very firm; continuous thin dark gray (5Y 4/1) clay films on faces of peds; few calcium carbonate concretions; strongly alkaline; diffuse smooth boundary.

Bng1—41 to 54 inches; gray (5Y 5/1) silty clay loam; common medium and coarse prominent yellowish brown (10YR 5/8) mottles; weak very coarse prismatic structure; firm; mildly alkaline; diffuse smooth boundary.

Bng2—54 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam; many medium and coarse prominent strong brown (7.5YR 5/6 and 5/8) mottles; moderate coarse prismatic structure parting to moderate coarse subangular blocky; firm; moderately alkaline.

The thickness of the solum ranges from 40 to more than 60 inches. The mollic epipedon is 8 to 11 inches thick. The thickness of the A horizon combined with that of the E horizon is 8 to 17 inches. The depth to the natric horizon ranges from 8 to 16 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The E horizon has value of 4 or 5 and chroma of 1 or 2. The Btng horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 1 or 2. It is neutral to strongly alkaline. The content of clay in this horizon ranges from 35 to 42 percent.

The Piasa soil in the map unit Virden-Piasa silt loams is a taxadjunct because it does not have an albic horizon. This difference, however, does not alter the usefulness or behavior of the soil.

Pike Series

The Pike series consists of well drained, moderately permeable soils on the tops of upland ridges. These soils formed in loess and in the underlying glacial drift. Slope ranges from 2 to 5 percent.

Pike soils are similar to Parke soils and commonly are adjacent to Hosmer, Marine, Negley, and Parke soils. The moderately well drained Hosmer and somewhat poorly drained Marine soils are on the lower ridgetops. Hosmer soils have a fragipan, and Marine soils contain more clay in the control section than the Pike soils. Negley soils have a fine-loamy control section. They are on side slopes. Parke soils also are on side slopes. They formed in a layer of loess thinner than that in which the Pike soils formed.

Typical pedon of Pike silt loam, 2 to 5 percent slopes, 1,600 feet north and 100 feet east of the center of sec. 12, T. 4 N., R. 4 W.

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; neutral; clear smooth boundary.

E—6 to 11 inches; yellowish brown (10YR 5/4) silt loam; moderate thick platy structure parting to weak fine subangular blocky; friable; few thin dark grayish brown (10YR 4/2) silt coatings on faces of peds; neutral; abrupt smooth boundary.

Bt1—11 to 14 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; few moderately thick dark brown (10YR 4/3) and common thin yellowish red (5YR 5/6) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—14 to 20 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; few fine black (10YR 2/1) stains (iron and manganese oxide); many moderately thick reddish brown (5YR 4/4) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt3—20 to 29 inches; dark yellowish brown (10YR 4/6) silty clay loam; strong medium prismatic structure parting to strong medium subangular blocky; firm; few fine black (10YR 2/1) stains (iron and manganese oxide); continuous thick reddish brown (5YR 4/3) clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt4—29 to 41 inches; yellowish brown (10YR 5/6) silty clay loam; strong coarse prismatic structure parting to moderate coarse subangular blocky; firm; continuous thick reddish brown (5YR 4/4) clay films on faces of peds and in root channels; few thin silt coatings on faces of peds, white (10YR 8/2) dry; few fine black (10YR 2/1) stains (iron and manganese oxide); strongly acid; clear smooth boundary.

Bt5—41 to 54 inches; strong brown (7.5YR 5/6) silty clay loam; moderate coarse prismatic structure parting to moderate coarse subangular blocky; firm; few thin silt coatings on faces of peds, white (10YR 8/2) dry; common moderately thick reddish brown (5YR 4/3) clay films on faces of peds; few fine black (10YR 2/1) stains (iron and manganese oxide); strongly acid; gradual smooth boundary.

Bt6—54 to 60 inches; strong brown (7.5YR 5/6) silt loam; weak coarse subangular blocky structure; friable; common moderately thick yellowish red (5YR 4/6) clay films on faces of peds; few thin silt coatings on faces of peds, white (10YR 8/2) dry; very strongly acid.

The thickness of the solum ranges from 60 to 90 inches. The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 through 6. The E horizon has value and chroma of 4 through 6. The Bt horizon has hue of 5YR through 10YR, value of 4 or 5, and chroma of 4 through 6. It is strongly acid or very strongly acid. It is silt loam or silty clay loam. The content of clay in this horizon ranges from 27 to 35 percent. The 2BC horizon is loam, silt loam, or sandy clay loam. It is strongly acid or very strongly acid.

Richview Series

The Richview series consists of moderately well drained, moderately permeable soils on side slopes and the convex tops of ridges in the uplands. These soils formed in loess over Illinoian till. Slope ranges from 1 to 10 percent.

Richview soils are similar to Parke soils and commonly are adjacent to Darmstadt, Hoyleton, and Tamalco soils. They are higher on the landscape than the adjacent soils. Darmstadt and Tamalco soils have a natric horizon. Also, Darmstadt soils are somewhat poorly drained. Hoyleton soils have a fine textured B horizon. They are somewhat poorly drained. Parke soils do not have a mollic surface layer.

Typical pedon of Richview silt loam, 1 to 5 percent slopes, about 3 miles south and 2.5 miles west of Greenville; 40 feet west and 2,046 feet south of the center of sec. 29, T. 5 N., R. 3 W.

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak very fine granular structure; friable; slightly acid; abrupt smooth boundary.

E—8 to 13 inches; brown (10YR 4/3) silt loam; weak very coarse platy structure parting to moderate fine and medium granular; friable; slightly acid; clear smooth boundary.

Bt1—13 to 19 inches; dark yellowish brown (10YR 4/4) silty clay loam; strong fine subangular blocky structure; firm; medium acid; clear smooth boundary.

Bt2—19 to 25 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine faint yellowish brown (10YR 5/6) mottles; strong fine and medium angular blocky structure; firm; common thin dark yellowish brown (10YR 3/4) clay films on faces of peds; medium acid; gradual smooth boundary.

Bt3—25 to 32 inches; dark yellowish brown (10YR 4/4) silty clay loam; many medium distinct yellowish brown (10YR 5/4) and brownish yellow (10YR 6/6) mottles; strong coarse and medium angular blocky structure; firm; common moderately thick dark yellowish brown (10YR 3/4) clay films of faces of peds; few patchy black (10YR 2/1) accumulations (iron and manganese oxide); strongly acid; gradual smooth boundary.

Bt4—32 to 44 inches; dark yellowish brown (10YR 4/4) silty clay loam; many medium distinct yellowish

brown (10YR 5/4) and brownish yellow (10YR 6/6) mottles; moderate coarse subangular blocky structure; firm; common moderately thick dark yellowish brown (10YR 3/4) clay films on faces of peds; few patchy black (10YR 2/1) accumulations (iron and manganese oxide); strongly acid; gradual smooth boundary.

2BC—44 to 54 inches; yellowish brown (10YR 5/4) silt loam; common fine faint gray (10YR 5/1) mottles; weak very coarse subangular blocky structure; firm; medium acid; diffuse smooth boundary.

2C—54 to 60 inches; brown (7.5YR 5/4) and dark brown (7.5YR 4/4) loam; massive; firm; many fine clean sand grains; few thick black (10YR 2/1) clay films lining pores; medium acid.

The thickness of the solum ranges from 42 to 65 inches. The thickness of the loess ranges from 35 to 50 inches. The mollic surface layer is 6 to 9 inches thick. The subsoil is slightly acid to very strongly acid.

The Ap horizon has value of 2 or 3 and chroma of 1 through 3. The E horizon has value of 4 or 5 and chroma of 2 or 3. Some pedons do not have an E horizon. The Bt horizon has value of 4 or 5 and chroma of 4 through 6. The content of clay in this horizon ranges from 27 to 35 percent. The 2BC horizon is silt loam, loam, or clay loam. The 2C horizon is loam or clay loam.

Rushville Series

The Rushville series consists of poorly drained, slowly permeable soils on uplands. These soils formed in loess. Slope ranges from 0 to 2 percent.

Rushville soils are similar to Wynoose soils and commonly are adjacent to Darmstadt, Marine, and Oconee soils. The adjacent soils are somewhat poorly drained and are higher on the landscape than the Rushville soils. Also, Darmstadt soils have a natric horizon, and Oconee soils have a mollic surface layer. Wynoose soils formed in a layer of loess thinner than that in which the Rushville soils formed.

Typical pedon of Rushville silt loam, 1,410 feet east and 1,020 feet south of the center of sec. 28, T. 6 N., R. 4 W.

Ap—0 to 8 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; weak fine granular structure; friable; common fine irregular concretions (iron and manganese oxide); very strongly acid; abrupt smooth boundary.

E1—8 to 13 inches; gray (10YR 5/1) silt loam; common fine and medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure parting to weak fine granular; friable; common fine to large irregular accumulations (iron and manganese oxide); very strongly acid; clear smooth boundary.

E2—13 to 20 inches; light gray (10YR 6/1) silt loam; common fine and medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure parting to weak fine granular; friable; common fine rounded concretions (iron and manganese oxide); very strongly acid; abrupt wavy boundary.

Btg1—20 to 27 inches; grayish brown (10YR 5/2) silty clay; many fine and medium distinct strong brown (7.5YR 5/6) mottles; moderate fine prismatic structure parting to moderate medium angular blocky; very firm; continuous moderately thick dark gray (10YR 4/1) clay films on faces of peds; strongly acid; clear smooth boundary.

Btg2—27 to 36 inches; grayish brown (10YR 5/2) silty clay; common medium distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure; very firm; continuous thick grayish brown (10YR 5/2) clay films on faces of peds; few medium rounded accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

Btg3—36 to 46 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium and coarse distinct strong brown (7.5YR 4/6) mottles; weak medium prismatic structure; very firm; continuous thick grayish brown (2.5Y 5/2) clay films on faces of peds; common medium irregular accumulations (iron and manganese oxide); medium acid; clear smooth boundary.

BCg—46 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam; few fine and medium distinct strong brown (7.5YR 5/6) mottles; weak medium prismatic structure; very firm; continuous thin light brownish gray (2.5Y 6/2) clay films on faces of peds and dark gray (10YR 4/1) clay films lining pores; neutral.

The thickness of the solum ranges from 45 to 70 inches. The Ap horizon is 6 to 8 inches thick. It has value of 4 or 5 and chroma of 2. The E horizon has value of 5 or 6 and chroma of 1 or 2. The Btg horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 or 2. It is medium acid to very strongly acid. It is silty clay loam or silty clay. The content of clay in this horizon ranges from 38 to 45 percent.

Stoy Series

The Stoy series consists of somewhat poorly drained, slowly permeable soils on broad ridgetops and along drainageways in the uplands. These soils formed in loess. Slope ranges from 0 to 5 percent.

Stoy soils are similar to Bluford soils and commonly are adjacent to Hickory, Hosmer, and Rushville soils. Bluford soils formed in a layer of loess thinner than that in which the Stoy soils formed. They have a fine textured control section. The well drained Hickory soils formed in

glacial till on side slopes along the steeper drainageways below the Stoy soils. The moderately well drained Hosmer soils are on the tops of the higher ridges. They have a fragipan in the lower part of the solum. The poorly drained Rushville soils are slightly lower on the landscape than the Stoy soils. They have a fine textured control section.

Typical pedon of Stoy silt loam, 2 to 5 percent slopes, 264 feet north and 560 feet west of the southeast corner of sec. 12, T. 5 N., R. 4 W.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, very pale brown (10YR 7/3) dry; weak medium granular structure; friable; few black (10YR 2/1) concretions (iron and manganese oxide); strongly acid; abrupt smooth boundary.

E—7 to 12 inches; yellowish brown (10YR 5/4) silt loam; moderate medium platy structure parting to weak fine subangular blocky; friable; common thin light gray (10YR 7/2) silt coatings on faces of peds; few black (10YR 2/1) concretions (iron and manganese oxide) less than 2 millimeters in diameter; very strongly acid; clear smooth boundary.

Bt1—12 to 18 inches; dark yellowish brown (10YR 4/6) silty clay loam; few fine distinct grayish brown (10YR 5/2) mottles; strong medium and fine subangular blocky structure; firm; continuous moderately thick brown (10YR 5/3) clay films and white (10YR 8/2) silt coatings on faces of peds; very strongly acid; abrupt smooth boundary.

Bt2—18 to 21 inches; dark yellowish brown (10YR 4/6) silty clay loam; few fine distinct grayish brown (10YR 5/2) mottles; strong medium prismatic structure parting to moderate medium angular and subangular blocky; firm; continuous moderately thick brown (10YR 4/3) clay films and thin white (10YR 8/2) silt coatings on faces of peds; very strongly acid; abrupt smooth boundary.

Bt3—21 to 34 inches; brown (10YR 5/3) silty clay loam; few fine faint gray (10YR 6/1) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; continuous moderately thick brown (10YR 5/3) clay films on faces of peds; very strongly acid; gradual smooth boundary.

Bt4—34 to 39 inches; brown (10YR 5/3) silty clay loam; common medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) mottles; weak medium prismatic structure parting to weak medium subangular blocky; firm; common thin brown (10YR 4/3) clay films on faces of peds; very strongly acid; clear smooth boundary.

Btx1—39 to 53 inches; brown (10YR 5/3) silt loam; common medium distinct yellowish brown (10YR 5/8) and common fine faint light brownish gray (10YR 6/2) and dark yellowish brown (10YR 4/4) mottles; weak coarse prismatic structure; firm; slightly brittle; common thin yellowish brown (10YR 5/4) clay films on faces of peds; very strongly acid; clear smooth boundary.

Btx2—53 to 60 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/6) mottles; weak coarse prismatic structure; firm; slightly brittle; few thin grayish brown (10YR 5/2) clay films on faces of peds; very strongly acid.

The thickness of the solum ranges from 42 to more than 60 inches. The depth to a horizon having the characteristics of a fragipan ranges from 30 to 45 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The E horizon has value of 4 through 6 and chroma of 2 through 4. Some eroded pedons do not have an E horizon. The Bt horizon has value of 4 through 6 and chroma of 3 through 6. It is strongly acid or very strongly acid. The content of clay in this horizon ranges from 27 to 35 percent. The Bx horizon is silty clay loam or silt loam. It is strongly acid or very strongly acid. Some pedons have a C horizon of silt loam.

Tamalco Series

The Tamalco series consists of moderately well drained, very slowly permeable soils on ridges in the uplands. These soils formed in loess. Slope ranges from 1 to 5 percent.

Tamalco soils commonly are adjacent to Darmstadt, Hoyleton, Oconee, and Richview soils. They are in positions on the landscape similar to those of the adjacent soils. Darmstadt soils are somewhat poorly drained. Hoyleton and Oconee soils also are somewhat poorly drained. They do not have a natric horizon. Also, Hoyleton soils formed in a layer of loess thinner than that in which the Tamalco soils formed. Richview soils do not have a natric horizon and have a mollic surface layer. They are on the higher ridges.

Typical pedon of Tamalco silt loam, 1 to 5 percent slopes, eroded, 670 feet east and 75 feet north of the center of sec. 10, T. 5 N., R. 2 W.

Ap—0 to 8 inches; dark brown (7.5YR 4/4) silt loam, brown (7.5YR 5/4) dry; moderate coarse granular structure; friable; strongly acid; abrupt smooth boundary.

Btn1—8 to 11 inches; reddish brown (5YR 4/4) silty clay; strong fine angular blocky structure; firm; continuous moderately thick dark reddish brown (5YR 3/4) clay films on faces of peds; very strongly acid; clear smooth boundary.

Btn2—11 to 17 inches; brown (7.5YR 4/4) silty clay loam; strong medium angular blocky structure; firm; many thin dark brown (7.5YR 4/2) clay films on

faces of peds; very strongly acid; gradual smooth boundary.

Btn3—17 to 22 inches; brown (10YR 5/3) silty clay loam; common fine and medium faint yellowish brown (10YR 5/6) and few medium distinct light brownish gray (2.5Y 6/2) mottles in the lower part; strong medium prismatic structure; firm; common thin brown (10YR 4/3) clay films on faces of prisms; strongly acid; clear smooth boundary.

Btn4—22 to 29 inches; pale brown (10YR 6/3) silty clay loam; common coarse distinct yellowish brown (10YR 5/6 and 5/8) mottles; moderate medium prismatic structure; firm; few thin dark grayish brown (10YR 4/2) clay films lining pores; mildly alkaline; clear smooth boundary.

Bn—29 to 46 inches; brown (10YR 5/3) silt loam; common medium distinct grayish brown (10YR 5/2) and strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure; firm; moderately alkaline; clear smooth boundary.

2BCng—46 to 53 inches; brown (7.5YR 5/2) silt loam; weak coarse prismatic structure; firm; many very thick light gray (10YR 7/2) coatings of clean silt and very fine sand filling large cracks; many fine and medium rounded accumulations (iron and manganese oxide); moderately alkaline; clear smooth boundary.

2Cn—53 to 60 inches; brown (7.5YR 5/4) silt loam; common coarse distinct grayish brown (10YR 5/2) mottles; massive; firm; moderately alkaline.

The thickness of the solum ranges from 40 to 60 inches. The A horizon is 10 to 14 inches thick. The depth to the natric horizon ranges from 20 to 35 inches.

The Ap horizon has value of 3 through 5 and chroma of 2 through 4. It is dominantly silt loam, but in some pedons it is silty clay loam. Some pedons have an E horizon, which has value of 4 or 5 and chroma of 2 through 4. The Btn horizon has hue of 10YR through 5YR, value of 4 through 6, and chroma of 3 through 8 and has mottles or coatings with lower chroma. It is silty clay loam or silty clay. The content of clay in this horizon ranges from 35 to 42 percent.

Tice Series

The Tice series consists of somewhat poorly drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slope ranges from 0 to 2 percent.

Tice soils are similar to Lawson soils and commonly are adjacent to Beaucoup, Huntsville, and Wakeland soils. Lawson soils are cumulic. Beaucoup soils are poorly drained and are in swales below the Tice soils. Huntsville soils are moderately well drained and are on the higher natural levees adjacent to drainageways. They are cumulic and contain less clay than the Tice soils. Wakeland soils are slightly lower on the landscape than the Tice soils. Also, they are more acid in the B horizon and contain less clay.

Typical pedon of Tice silty clay loam, 2,244 feet west and 90 feet north of the southeast corner of sec. 26, T. 4 N., R. 4 W.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; firm; neutral; clear smooth boundary.

A—10 to 17 inches; dark grayish brown (10YR 4/2) and very dark grayish brown (10YR 3/2) silty clay loam, light brownish gray (10YR 6/2) dry; moderate very fine subangular blocky structure; firm; neutral; abrupt smooth boundary.

BA—17 to 22 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine distinct grayish brown (10YR 5/2) and reddish yellow (7.5YR 6/8) mottles; moderate fine subangular blocky structure; firm; neutral; clear smooth boundary.

Bw—22 to 37 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct dark yellowish brown (10YR 4/4) and strong brown (7.5YR 4/6) and few fine distinct light gray (10YR 6/1) mottles; weak medium prismatic structure; firm; neutral; clear smooth boundary.

BC—37 to 53 inches; dark yellowish brown (10YR 4/4) silty clay loam; many medium distinct light brownish gray (10YR 6/2) and common fine distinct yellowish brown (10YR 5/8) mottles; weak medium prismatic structure; firm; slightly acid; clear smooth boundary.

C—53 to 60 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct pinkish gray (7.5YR 6/2), light gray (10YR 6/1), and strong brown (7.5YR 4/6) mottles; massive; firm; slightly acid.

The thickness of the solum ranges from 40 to 60 inches. The thickness of the mollic epipedon ranges from 10 to 18 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 through 3. It is dominantly silty clay loam, but in some pedons it is silt loam. The Bw horizon has value of 4 or 5 and chroma of 2 through 4. The content of clay in this horizon ranges from 27 to 35 percent. In some pedons the lower part of the Bw horizon and the C horizon have thin strata of silt loam, loam, or sandy loam.

Titus Series

The Titus series consists of poorly drained, slowly permeable soils on bottom land. These soils formed in slack water sediments. Slope ranges from 0 to 2 percent.

Titus soils are similar to Beaucoup soils and commonly are adjacent to Beaucoup, Hickory, and Wakeland soils. Beaucoup soils contain less clay in the solum than the Titus soils. Also, they are slightly higher on the

landscape. Hickory soils are well drained and are on side slopes above the Titus soils. Wakeland soils are somewhat poorly drained and are on narrow bottom land and on natural levees along the major streams.

Typical pedon of Titus silty clay loam, 740 feet north and 140 feet east of the center of sec. 25, T. 5 N., R. 4 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak fine and medium angular blocky structure; very firm; common reddish brown (5YR 4/4) and yellowish red (5YR 5/8) stains (iron and manganese oxide) on faces of peds and in root channels; neutral; clear smooth boundary.

A1—8 to 12 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; few coarse faint dark gray (10YR 4/1) mottles; weak fine prismatic structure parting to moderate fine angular blocky; very firm; many red (2.5YR 4/6 and 4/8) stains (iron and manganese oxide) on faces of peds; slightly acid; clear smooth boundary.

A2—12 to 20 inches; black (10YR 2/1) silty clay; common medium distinct dark gray (10YR 4/1) mottles; moderate fine and medium angular blocky structure; very firm; common yellowish red (5YR 4/6) stains (iron and manganese oxide) on faces of peds; neutral; clear smooth boundary.

Bg1—20 to 28 inches; dark gray (10YR 4/1) silty clay loam; common medium distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; very firm; discontinuous thin very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bg2—28 to 38 inches; dark gray (10YR 4/1) silty clay loam; few medium distinct yellowish brown (10YR 5/4) mottles; weak medium prismatic structure; very firm; discontinuous thin very dark gray (10YR 3/1) organic coatings on faces of peds; few medium and coarse irregular concretions (iron and manganese oxide); neutral; clear smooth boundary.

BCg—38 to 50 inches; dark gray (10YR 4/1) silty clay loam; common medium and coarse prominent brown (7.5YR 5/4) and dark brown (10YR 4/4) mottles; weak medium prismatic structure; very firm; neutral; diffuse smooth boundary.

Cg—50 to 60 inches; dark gray (10YR 4/1) silty clay loam; common medium and coarse prominent brown (7.5YR 5/4) mottles; massive; firm; neutral.

The thickness of the solum ranges from 40 to 60 inches. The thickness of the mollic epipedon ranges from 12 to 23 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. It is dominantly silty clay loam, but in some pedons it is silty clay. The Bg horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 0 through 2 and has mottles with higher chroma. It is slightly acid or neutral. It is silty clay loam or silty clay. The content of clay in this horizon ranges from 35 to 45 percent.

Virden Series

The Virden series consists of poorly drained, moderately slowly permeable soils on uplands. These soils formed in loess. Slope ranges from 0 to 2 percent.

Virden soils are similar to Ebbert soils and commonly are adjacent to Cisne, Ebbert, Herrick, and Piasa soils. All of the similar and adjacent soils have an E horizon. Cisne soils are slightly higher on the landscape than the Virden soils. Also, their dark surface layer is thinner. Herrick soils are somewhat poorly drained and are on low ridges above the Virden soils. Piasa soils have a natric horizon. They occur as areas closely intermingled with areas of the Virden soils.

Typical pedon of Virden silt loam, about 1 mile east and 0.5 mile south of Greenville; 1,348 feet south and 132 feet west of the northeast corner of sec. 14, T. 5 N., R. 3 W.

Ap—0 to 8 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate medium granular structure; friable; slightly acid; abrupt smooth boundary.

A—8 to 12 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and very fine angular blocky structure; firm; slightly acid; clear smooth boundary.

Btg1—12 to 16 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; few fine faint dark grayish brown (10YR 4/2) mottles; moderate medium and fine angular blocky structure; firm; continuous thin very dark gray (10YR 3/1) clay films on faces of peds; slightly acid; gradual smooth boundary.

Btg2—16 to 21 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine and medium distinct dark yellowish brown (10YR 4/6 and 4/4) mottles; strong fine prismatic structure parting to moderate medium angular blocky; firm; continuous thin grayish brown (2.5Y 5/2) clay films on faces of peds; few small concretions (iron and manganese oxide); neutral; clear smooth boundary.

Btg3—21 to 27 inches; light brownish gray (2.5Y 6/2) silty clay loam; many medium prominent strong brown (7.5YR 5/6 and 5/8) mottles; strong medium prismatic structure parting to strong medium angular blocky; firm; continuous moderately thick grayish brown (2.5Y 5/2) clay films on faces of peds; many concretions (iron and manganese oxide); neutral; gradual smooth boundary.

Btg4—27 to 36 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine and medium distinct yellowish brown (10YR 5/6 and 5/8) mottles; moderate coarse and medium prismatic structure

parting to weak coarse angular blocky; firm; continuous thin grayish brown (2.5Y 5/2) clay films on faces of peds; neutral; gradual smooth boundary.

BCg—36 to 50 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; firm; neutral; gradual smooth boundary.

Cg—50 to 60 inches; mixed gray (10YR 5/1) and dark gray (10YR 4/1) silt loam; few medium distinct dark brown (10YR 3/3) mottles; massive; friable; neutral.

The thickness of the solum ranges from 40 to more than 60 inches. The thickness of the mollic epipedon ranges from 15 to 24 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. It is dominantly silt loam, but the range includes silty clay loam. The Bt horizon has hue of 10YR through 5Y, value of 3 through 6, chroma of 1 or 2 and has mottles with higher chroma. It is slightly acid or neutral. It is silty clay loam or silty clay. The content of clay in this horizon ranges from 35 to 40 percent. The C horizon is silt loam or silty clay loam.

Wakeland Series

The Wakeland series consists of somewhat poorly drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slope ranges from 0 to 2 percent.

Wakeland soils are similar to Birds soils and commonly are adjacent to Birds, Hickory, and Lawson soils. The poorly drained Birds soils are slightly lower on the landscape than the Wakeland soils. The well drained Hickory soils are on side slopes above the Wakeland soils. Lawson soils have a mollic epipedon. They are on the wider parts of the bottom land.

Typical pedon of Wakeland silt loam, 450 feet east and 250 feet south of the northwest corner of sec. 15, T. 4 N., R. 3 W.

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak coarse platy structure parting to weak fine granular; friable; slightly acid; abrupt smooth boundary.

C1—10 to 23 inches; dark grayish brown (10YR 4/2) silt loam; few fine faint grayish brown (10YR 5/2) mottles; weak fine granular structure; friable; neutral; abrupt smooth boundary.

C2—23 to 47 inches; dark grayish brown (10YR 4/2) silt loam; common medium distinct grayish brown (2.5Y 5/2) mottles; massive; friable; neutral; clear smooth boundary.

Ab—47 to 60 inches; very dark gray (10YR 3/1) silt loam; few fine distinct olive brown (2.5Y 4/4) mottles; weak medium subangular blocky structure; friable; neutral.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The C horizon has value of 4 through 6. It generally has chroma of 1 or 2 but in some pedons has chroma of 3 below a depth of 30 inches. Some pedons do not have a dark buried horizon. The 10- to 40-inch control section ranges from 12 to 18 percent clay. It is slightly acid or neutral.

Wynoose Series

The Wynoose series consists of poorly drained, very slowly permeable soils on broad till plains. These soils formed in loess over Illinoian till. Slope ranges from 0 to 2 percent.

Wynoose soils are similar to Rushville soils and commonly are adjacent to Ava and Bluford soils. The moderately well drained Ava soils are on ridges above the Wynoose soils. They have a fragipan. The somewhat poorly drained Bluford soils are on the more undulating parts of the till plains. Unlike the Wynoose soils, they are not characterized by an abrupt textural change between the E and B horizons. Rushville soils formed in a layer of loess thicker than that in which the Wynoose soils formed. They are on broad till plains in the western part of the county.

Typical pedon of Wynoose silt loam, about 2.5 miles south and 0.5 mile west of Mulberry Grove; 1,382 feet north and 1,320 feet west of the southeast corner of sec. 11, T. 5 N., R. 2 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 7/2) dry; weak fine granular structure; friable; very strongly acid; abrupt smooth boundary.

E1—8 to 17 inches; light brownish gray (10YR 6/2) silt loam, white (10YR 8/1) dry; common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse platy structure parting to weak medium granular; friable; common medium black (10YR 2/1) concretions (iron and manganese oxide); very strongly acid; gradual smooth boundary.

E2—17 to 22 inches; light gray (10YR 6/1) silt loam, white (10YR 8/1) dry; few fine distinct dark yellowish brown (10YR 4/4) mottles; weak coarse platy structure parting to weak fine and medium granular; friable; many fine and medium black (10YR 2/1) and very dark brown (10YR 2/2) concretions (iron and manganese oxide); extremely acid; abrupt smooth boundary.

B/E—22 to 25 inches; gray (10YR 5/1) silty clay loam (Bt); many medium distinct brown (7.5YR 5/4) mottles; strong fine and medium angular blocky structure; firm; continuous thick light gray (10YR 6/1) silt coatings on faces of peds (E); extremely acid; abrupt smooth boundary.

Btg1—25 to 28 inches; gray (10YR 5/1) silty clay loam; few fine distinct brown (7.5YR 5/4) mottles; strong

medium prismatic structure parting to strong coarse and medium angular blocky; very firm; continuous moderately thick dark gray (10YR 4/1) clay films on faces of peds; many fine and medium black (10YR 2/1) concretions (iron and manganese oxide); extremely acid; clear smooth boundary.

Btg2—28 to 34 inches; light brownish gray (10YR 6/2) silty clay loam; many medium and fine distinct dark yellowish brown (10YR 4/4) and brown (7.5YR 4/4) mottles; strong medium and coarse prismatic structure parting to strong medium and coarse angular blocky; firm; continuous moderately thick dark grayish brown (10YR 4/2) clay films on faces of peds; common fine black (10YR 2/1) concretions (iron and manganese oxide); extremely acid; gradual smooth boundary.

Btg3—34 to 41 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine distinct dark brown (10YR 4/3) and yellowish brown (10YR 5/4) mottles; moderate coarse prismatic structure parting to weak medium angular blocky; firm; common thin light brownish gray (2.5Y 6/2) clay films on faces of peds; very strongly acid; gradual smooth boundary.

BCg—41 to 49 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine distinct dark brown (10YR 4/3) mottles; weak coarse prismatic structure; firm; very strongly acid; abrupt smooth boundary.

2Cg—49 to 60 inches; dark gray (10YR 4/1) loam; few medium and coarse prominent strong brown (7.5YR 5/6) mottles; massive; firm; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The thickness of the loess ranges from 30 to 45 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The E horizon has value of 4 through 6 and chroma of 1 or 2. The Bt horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 1 through 3. It is strongly acid to extremely acid. It is silty clay loam or silty clay. The content of clay in this horizon ranges from 35 to 42 percent. The 2B and 2C horizons are silty clay loam, silt loam, loam, or clay loam.

Formation of the Soils

Soil forms as a result of the interactions among soil-forming processes (*10*). The characteristics of a soil at any given place are determined by the physical and mineralogical composition of the parent material; the climate under which the soil material has accumulated and existed since accumulation; the native vegetation and animal life on and in the soil; the relief, or lay of the land; and the amount of time that the soil-forming factors have acted on the soil material.

Climate and vegetation and animal life are active factors of soil formation. They act on the parent material, slowly changing it to a natural body that has genetically related horizons. The effects of climate, vegetation, and animal life are conditioned by relief. The parent material affects the kind of soil profile that forms and in a few areas determines it almost entirely. Time is needed for changing the parent material into a soil. The five factors of soil formation are so closely interrelated that the effect of one factor can be explained only if conditions for the other factors are specified.

Parent Material

Parent material is the unconsolidated geologic material in which a soil forms. It affects the mineralogical and chemical nature of the soil and, to a large extent, determines the rate of soil formation. The soils in Bond County formed in loess, alluvium, and glacial material.

About 74 percent of the soils in Bond County formed either partly or entirely in loess, which is wind-blown silt. A primary source of the loess was the flood plains along the Mississippi and Missouri Rivers. The flood plain along Shoal Creek was a minor source. The thickness of the loess mantle decreases as slope increases. It also decreases gradually from the western part of the county to the eastern part. In the western part it generally is 5 to 6 feet thick. Cowden and Marine are examples of soils that formed in more than 5 feet of loess. The Ava, Bluford, and Cisne soils in the eastern part of the county formed in about 3 feet of loess and in the underlying material (*4*).

About 11 percent of the soils formed in alluvial sediments on flood plains. These sediments were deposited by water. Their texture is determined by the velocity of the flowing water. Most of the soils on the flood plains formed in medium textured alluvium. Examples are Birds, Lawson, and Wakeland soils, which formed in silt loam sediments. Soils in sloughs, swales, and other slack water areas formed in moderately fine textured and fine textured alluvium. Examples are Beaucoup and Tice soils, which formed in stratified silty clay loam sediments, and Titus soils, which formed in silty clay loam and silty clay sediments.

About 15 percent of the soils formed in glacial material, which underlies the soils on uplands and is exposed along some drainageways. This material is either Vandalia till or Hagerstown drift, both of which are members of the Glassford Formation of Illinoian age. The Vandalia till is more extensive than the Hagarstown drift. It was transported and deposited by the Illinoian ice sheet. It is loamy. The Hagarstown drift was deposited and reworked by glacial melt water in crevices in the ice sheet. It commonly overlies the Vandalia till. It generally is coarser textured and redder throughout than the Vandalia till. Many of the prominent oval and oblong ridges in the county have cores consisting of Hagarstown drift. Atlas, Grantfork, and Hickory soils formed in Vandalia till (fig. 16), and Negley soils formed in Hagarstown drift.

About 15 percent of the soils in the survey area are affected by sodium. These are the Darmstadt, Grantfork, Huey, Piasa, and Tamalco soils, which have a high content of sodium in the subsoil. The source of the sodium is the feldspars in the loess. The sodium weathered from the sodium-rich feldspars and was concentrated by the lateral movement of the ground water above the Illinoian till. The lateral movement is caused by a variation in the permeability of the till (*18*). In the Grantfork soils the source of the sodium is leachate, which probably originated from chemical weathering of sodium-rich feldspars in the loess of the soils upslope.

Climate

Bond County has a temperate, humid, continental climate. Because it is essentially uniform throughout the county, climate has not caused any obvious differences among the soils within the county. It has differentiated those soils, however, from the soils in other broad regions.

Climate is a very important factor of soil formation because it affects weathering, vegetation, and erosion. Temperature and precipitation affect the physical and chemical nature of the soil. The weathering of minerals

Figure 16.—Profile of Hickory silt loam, which formed in Illinoian till. The till is clay loam mixed with sand and gravel.

in the soil increases as temperature increases. As water moves through the soil, soluble salts are dissolved and transported downward. The water also transports clay-size particles from the surface soil into the subsoil. The Alfisols in Bond County are characterized by this translocation of clay. The temperature and precipitation in the county favor both prairie and forest vegetation. Precipitation can also affect soil formation through its effect on erosion. As the rate of erosion approaches the rate of soil formation, the soil generally exhibits less profile development.

Additional information about the climate is given under the heading "General Nature of the County."

Vegetaton and Animal Life

Soils are affected by the vegetaton under which they formed. The native vegetation in Bond County was mainly deciduous hardwood trees and prairie grasses. Hickory, Wynoose, and other soils that formed under forest vegetation have a thin, relatively light colored surface layer. As the leaf litter decomposes, organic matter is added to the surface layer. Herrick, Virden, and other soils that formed under prairie grasses have a thick, dark surface soil. The many, fine, fibrous grass roots in the upper part of these soils add large amounts of organic matter when they die and decompose.

Living organisms other than trees and grasses have also contributed to the formation of soils. These include the micro-organisms, bacteria, fungi, earthworms, insects, and burrowing animals that live on or in the soil. They affect the decompostion of organic material and mix and churn the soil.

Human activities can also affect soil formation. Farming can reduce the content of organic matter in the surface soil and increase the rates of runoff and erosion. Building dikes and levees can reduce the frequency of flooding. Installing subsurface drains can lower the water table in some soils.

Relief

Relief tends to modify the effects of the other soil-forming factors. It controls the amount of water in the soil through its effect on runoff and infiltration rates.

Differences in natural drainage generally are closely associated with slope or relief. Soils that formed in the more sloping uplands are well drained and have a brown and yellowish brown subsoil. Douglas and Hickory soils are examples. Soils that formed in low areas, such as shallow depressions, and on broad, nearly level plains are poorly drained and have a gray subsoil. Ebbert and Rushville soils are examples. Soils that formed in some of the intermediate landscape positions, such as low ridges and gently sloping side slopes, are somewhat poorly drained and have a mixed or mottled, gray and brown subsoil. Oconee and Stoy soils are examples.

Time

Time affects the degree of profile development in the soil. The influence of time, however, can be modified by

the deposition of new material and by topography. Birds, Wakeland, and other bottom land soils that are subject to flooding receive new deposits each time they are flooded. As a result, they are much younger than the other soils in the county and have a weakly expressed profile Nearly level soils commonly are genetically and morphologically older than the more sloping soils because the slope affects the amount of water that penetrates the surface. The degree of profile development tends to decrease as slope increases.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere, the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough

during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial melt water.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial melt water. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Kame (geology). An irregular, short ridge or hill of stratified glacial drift.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH

7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to insure satisfactory performance of the soil for a specific use.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium absorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to Ca^{++} + Mg^{++} The degrees of sodicity are—

	SAR
Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of

separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded and 6 to 15 inches (15 to 38 centimeters) in length if flat.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons. Includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-73 at Hillsboro, Illinois]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	38.1	19.7	28.9	65	-11	21	1.73	0.81	2.48	4	3.6
February---	43.4	23.7	33.6	70	-4	40	2.12	.98	3.05	5	3.7
March------	52.7	31.2	42.0	80	8	191	3.03	1.61	4.19	7	3.2
April------	66.8	43.1	55.0	87	23	450	4.15	2.52	5.61	8	.7
May--------	75.9	52.5	64.2	92	32	750	4.40	2.46	5.99	7	.0
June-------	85.2	61.6	73.5	98	44	1,005	4.39	1.72	6.54	6	.0
July-------	88.0	65.3	76.7	100	49	1,138	4.13	2.16	5.73	6	.0
August-----	86.7	63.1	74.9	98	47	1,082	3.31	1.85	4.50	5	.0
September--	80.9	55.9	68.4	97	37	852	3.14	1.42	4.54	5	.0
October----	70.0	45.0	57.5	89	24	543	2.69	.91	4.10	5	.0
November---	53.8	33.5	43.7	77	10	161	2.79	1.38	3.94	5	1.1
December---	42.0	24.5	33.3	68	-4	62	2.92	.83	4.60	6	3.5
Yearly:											
Average--	65.3	43.3	54.3	---	---	---	---	---	---	---	---
Extreme--	---	---	---	101	-12	---	---	---	---	---	---
Total----	---	---	---	---	---	6,295	38.80	31.77	45.51	69	15.8

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-73 at Hillsboro, Illinois]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 11	April 23	May 3
2 years in 10 later than--	April 6	April 17	April 28
5 years in 10 later than--	March 28	April 8	April 19
First freezing temperature in fall:			
1 year in 10 earlier than--	October 21	October 17	October 5
2 years in 10 earlier than--	October 26	October 21	October 9
5 years in 10 earlier than--	November 6	October 29	October 18

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-73 at Hillsboro, Illinois]

Probability	Daily minimum temperature		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	197	183	164
8 years in 10	206	190	170
5 years in 10	222	203	181
2 years in 10	238	216	193
1 year in 10	247	223	199

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
2	Cisne silt loam	10,015	4.1
3A	Hoyleton silt loam, 0 to 2 percent slopes	5,288	2.2
3B	Hoyleton silt loam, 2 to 5 percent slopes	4,915	2.0
3B2	Hoyleton silt loam, 2 to 5 percent slopes, eroded	4,380	1.8
4B	Richview silt loam, 1 to 5 percent slopes	601	0.2
4C2	Richview silt loam, 5 to 10 percent slopes, eroded	1,062	0.4
7C3	Atlas silty clay loam, 5 to 10 percent slopes, severely eroded	7,971	3.3
8F	Hickory silt loam, 15 to 30 percent slopes	20,024	8.1
12	Wynoose silt loam	362	0.1
13A	Bluford silt loam, 0 to 2 percent slopes	5,537	2.3
13B	Bluford silt loam, 2 to 5 percent slopes	3,033	1.2
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	3,153	1.3
14B	Ava silt loam, 1 to 5 percent slopes	3,373	1.4
14C2	Ava silt loam, 5 to 10 percent slopes, eroded	2,537	1.0
15C2	Parke silt loam, 5 to 12 percent slopes, eroded	2,200	0.9
16	Rushville silt loam	975	0.4
46	Herrick silt loam	366	0.2
48	Ebbert silt loam	2,247	0.9
50	Virden silt loam	916	0.4
70	Beaucoup silty clay loam	2,657	1.1
77A	Huntsville silt loam, 0 to 3 percent slopes	820	0.3
77B	Huntsville loam, 1 to 5 percent slopes	751	0.3
112	Cowden silt loam	1,958	0.8
113A	Oconee silt loam, 0 to 2 percent slopes	3,389	1.4
113B	Oconee silt loam, 2 to 5 percent slopes	3,584	1.5
113B2	Oconee silt loam, 2 to 5 percent slopes, eroded	1,654	0.7
120	Huey silt loam	1,026	0.4
128B	Douglas silt loam, 2 to 7 percent slopes	707	0.3
164A	Stoy silt loam, 0 to 2 percent slopes	2,589	1.1
164B	Stoy silt loam, 2 to 5 percent slopes	2,389	1.0
164B2	Stoy silt loam, 2 to 5 percent slopes, eroded	3,004	1.2
214B	Hosmer silt loam, 2 to 5 percent slopes	5,328	2.2
214C2	Hosmer silt loam, 5 to 10 percent slopes, eroded	2,529	1.0
218	Newberry silt loam	1,641	0.7
242B	Kendall silt loam, 1 to 5 percent slopes	1,374	0.6
284	Tice silty clay loam	692	0.3
287A	Chauncey silt loam, 0 to 3 percent slopes	1,992	0.8
331	Haymond silt loam	310	0.1
333	Wakeland silt loam	11,349	4.6
334	Birds silt loam	2,958	1.2
337A	Creal silt loam, 0 to 3 percent slopes	219	0.1
404	Titus silty clay loam	515	0.2
451	Lawson silt loam	6,874	2.8
474	Piasa silt loam	934	0.4
517A	Marine silt loam, 0 to 2 percent slopes	3,836	1.6
517B	Marine silt loam, 2 to 4 percent slopes	6,389	2.6
570C3	Martinsville silt loam, 5 to 10 percent slopes, severely eroded	402	0.2
581B2	Tamalco silt loam, 1 to 5 percent slopes, eroded	2,902	1.2
583B	Pike silt loam, 2 to 5 percent slopes	2,062	0.8
585D	Negley silt loam, 10 to 15 percent slopes	505	0.2
620A	Darmstadt silt loam, 0 to 2 percent slopes	1,986	0.8
620B3	Darmstadt silty clay loam, 2 to 5 percent slopes, severely eroded	2,524	1.0
802	Orthents, loamy	534	0.2
865	Pits, gravel	248	0.1
912A	Hoyleton-Darmstadt silt loams, 0 to 2 percent slopes	10,864	4.4
912B2	Hoyleton-Darmstadt silt loams, 2 to 5 percent slopes, eroded	5,384	2.2
914C3	Atlas-Grantfork silty clay loams, 4 to 10 percent slopes, severely eroded	1,177	0.5
916A	Oconee-Darmstadt silt loams, 0 to 3 percent slopes	15,398	6.3
916B2	Oconee-Darmstadt silt loams, 2 to 5 percent slopes, eroded	8,083	3.3
941	Virden-Piasa silt loams	3,281	1.3
946D3	Hickory-Atlas complex, 10 to 15 percent slopes, severely eroded	3,033	1.2
967F	Hickory-Gosport complex, 15 to 30 percent slopes	3,572	1.5
991	Cisne-Huey silt loams	18,474	7.5
993	Cowden-Piasa silt loams	9,839	4.0
995	Herrick-Piasa silt loams	2,050	0.8
	Water	2,379	1.0
	Total	245,120	100.0

TABLE 5.--PRIME FARMLAND

[Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name]

Map symbol	Soil name
2	Cisne silt loam (where drained)
3A	Hoyleton silt loam, 0 to 2 percent slopes
3B	Hoyleton silt loam, 2 to 5 percent slopes
3B2	Hoyleton silt loam, 2 to 5 percent slopes, eroded
4B	Richview silt loam, 1 to 5 percent slopes
13A	Bluford silt loam, 0 to 2 percent slopes (where drained)
13B	Bluford silt loam, 2 to 5 percent slopes (where drained)
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded (where drained)
14B	Ava silt loam, 1 to 5 percent slopes
46	Herrick silt loam
48	Ebbert silt loam (where drained)
50	Virden silt loam (where drained)
70	Beaucoup silty clay loam (where drained and not frequently flooded during the growing season)
77A	Huntsville silt loam, 0 to 3 percent slopes
77B	Huntsville loam, 1 to 5 percent slopes
112	Cowden silt loam (where drained)
113A	Oconee silt loam, 0 to 2 percent slopes (where drained)
113B	Oconee silt loam, 2 to 5 percent slopes (where drained)
113B2	Oconee silt loam, 2 to 5 percent slopes, eroded (where drained)
128B	Douglas silt loam, 2 to 7 percent slopes
164A	Stoy silt loam, 0 to 2 percent slopes
164B	Stoy silt loam, 2 to 5 percent slopes
164B2	Stoy silt loam, 2 to 5 percent slopes, eroded
214B	Hosmer silt loam, 2 to 5 percent slopes
218	Newberry silt loam (where drained)
242B	Kendall silt loam, 1 to 5 percent slopes (where drained)
284	Tice silty clay loam
287A	Chauncey silt loam, 0 to 3 percent slopes (where drained)
331	Haymond silt loam
333	Wakeland silt loam (where drained)
334	Birds silt loam (where drained and not frequently flooded during the growing season)
337A	Creal silt loam, 0 to 3 percent slopes
451	Lawson silt loam
517A	Marine silt loam, 0 to 2 percent slopes (where drained)
517B	Marine silt loam, 2 to 4 percent slopes (where drained)
583B	Pike silt loam, 2 to 5 percent slopes

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Capability subclass	Corn	Soybeans	Winter wheat	Grass-legume hay	Grass-clover
		Bu	Bu	Bu	Ton	AUM*
2--------------- Cisne	IIIw	115	35	52	4.5	7.5
3A-------------- Hoyleton	IIw	116	34	53	4.7	7.5
3B-------------- Hoyleton	IIe	115	34	52	4.7	7.4
3B2------------- Hoyleton	IIe	111	33	51	4.5	7.2
4B-------------- Richview	IIe	109	33	50	4.6	---
4C2------------- Richview	IIe	107	32	49	4.5	---
7C3------------- Atlas	IVe	---	---	16	1.8	3.0
8F-------------- Hickory	VIe	---	---	---	2.4	---
12-------------- Wynoose	IIIw	96	33	46	3.9	6.5
13A------------- Bluford	IIw	103	33	49	4.1	6.8
13B------------- Bluford	IIe	102	33	49	4.1	6.7
13B2------------ Bluford	IIe	99	32	47	3.9	6.5
14B------------- Ava	IIe	97	33	48	4.3	---
14C2------------ Ava	IIIe	94	32	46	4.1	---
15C2------------ Parke	IIIe	105	37	42	3.4	---
16-------------- Rushville	IIIw	114	36	47	4.2	7.0
46-------------- Herrick	IIw	141	45	61	5.5	9.2
48-------------- Ebbert	IIw	130	42	54	5.0	---
50-------------- Virden	IIw	144	46	60	5.3	8.8
70-------------- Beaucoup	IIw	138	46	55	5.1	8.5
77A------------- Huntsville	IIw	106	34	45	4.1	---
77B------------- Huntsville	IIe	150	48	63	5.7	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Capability subclass	Corn	Soybeans	Winter wheat	Grass-legume hay	Grass-clover
		Bu	Bu	Bu	Ton	AUM*
112------------- Cowden	IIw	120	37	53	4.8	---
113A------------ Oconee	IIw	120	36	54	5.0	---
113B------------ Oconee	IIe	119	36	53	4.9	---
113B2----------- Oconee	IIe	115	35	52	4.8	---
120------------- Huey	IVw	64	23	33	2.6	---
128B------------ Douglas	IIe	134	42	58	5.2	---
164A------------ Stoy	IIw	112	35	52	4.5	7.5
164B------------ Stoy	IIe	107	34	50	4.3	7.2
164B2----------- Stoy	IIe	111	35	51	4.5	7.4
214B------------ Hosmer	IIe	105	37	47	3.4	---
214C2----------- Hosmer	IIIe	85	30	38	2.8	---
218------------- Newberry	IIw	118	37	---	4.5	7.5
242B------------ Kendall	IIe	134	41	54	5.1	---
284------------- Tice	IIw	130	40	---	4.8	8.1
287A------------ Chauncey	IIIw	120	37	53	4.7	7.8
331------------- Haymond	IIw	110	39	42	3.7	---
333------------- Wakeland	IIw	115	40	46	4.4	---
334------------- Birds	IIIw	122	42	52	4.4	7.3
337A------------ Creal	IIw	109	35	51	4.3	7.2
404------------- Titus	IVw	75	25	31	2.6	4.3
451------------- Lawson	IIw	130	---	---	5.5	---
474------------- Piasa	IIIw	77	28	37	3.1	5.2
517A------------ Marine	IIw	120	28	50	4.8	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Capability subclass	Corn	Soybeans	Winter wheat	Grass-legume hay	Grass-clover
		Bu	Bu	Bu	Ton	AUM*
517B------------ Marine	IIe	119	38	50	4.8	---
570C3----------- Martinsville	IVe	105	32	44	4.2	---
581B2----------- Tamalco	IIIe	65	23	32	2.7	4.6
583B------------ Pike	IIe	120	42	48	4.0	---
585D------------ Negley	IIIe	75	15	30	2.5	---
620A------------ Darmstadt	IIIw	69	26	36	3.0	5.0
620B3----------- Darmstadt	IIIe	55	---	28	2.4	4.0
802**. Orthents						
865**. Pits						
912A------------ Hoyleton-Darmstadt	IIIw	95	30	46	3.9	6.4
912B2----------- Hoyleton-Darmstadt	IIIe	93	30	44	3.8	6.2
914C3----------- Atlas-Grantfork	VIe	---	---	20	2.1	---
916A------------ Oconee-Darmstadt	IIIw	97	31	46	4.1	---
916B2----------- Oconee-Darmstadt	IIIe	96	31	45	3.9	---
941------------- Virden-Piasa	IIIw	---	---	---	---	---
946D3----------- Hickory-Atlas	VIe	---	---	---	2.1	---
967F------------ Hickory-Gosport	VIIe	---	---	---	2.1	---
991------------- Cisne-Huey	IVw	92	30	44	3.6	---
993------------- Cowden-Piasa	IIIw	100	33	45	4.0	---
995------------- Herrick-Piasa	IIIw	110	37	50	4.4	7.2

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.
** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordi-nation symbol	Management concerns: Erosion hazard	Management concerns: Equip-ment limita-tion	Management concerns: Seedling mortal-ity	Management concerns: Wind-throw hazard	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
2----------------- Cisne	4w	Slight	Severe	Moderate	Moderate	Pin oak-------------	70	Pin oak, green ash, water tupelo, red maple.
						White oak-----------	---	
						Black oak-----------	---	
						Bitternut hickory---	---	
3A, 3B, 3B2-------- Hoyleton	3o	Slight	Slight	Slight	Slight	White oak-----------	70	Shortleaf pine, white oak, eastern white pine, eastern cottonwood, northern red oak, green ash.
						Northern red oak----	70	
						Green ash-----------	---	
						Bur oak-------------	---	
4B, 4C2----------- Richview	3o	Slight	Slight	Slight	Slight	White oak-----------	70	Shortleaf pine, loblolly pine, eastern white pine, eastern redcedar.
						Northern red oak----	70	
						Green ash-----------	---	
						Bur oak-------------	---	
7C3--------------- Atlas	3c	Slight	Slight	Moderate	Moderate	White oak-----------	70	Red pine, Scotch pine, eastern redcedar, eastern white pine.
						Northern red oak----	70	
						Bur oak-------------	70	
						Green ash-----------	---	
8F---------------- Hickory	1r	Moderate	Moderate	Slight	Slight	White oak-----------	85	Eastern white pine, red pine, yellow-poplar, sugar maple, white oak, black walnut.
						Northern red oak----	85	
						Black oak-----------	---	
						Green ash-----------	---	
						Bitternut hickory---	---	
						Yellow-poplar-------	95	
12---------------- Wynoose	4w	Slight	Severe	Moderate	Moderate	Pin oak-------------	70	Baldcypress, pin oak, water tupelo, red maple.
						White oak-----------	---	
						Black oak-----------	---	
13A, 13B, 13B2----- Bluford	3o	Slight	Slight	Slight	Slight	White oak-----------	70	Shortleaf pine, loblolly pine, eastern white pine, eastern redcedar.
						Northern red oak----	70	
						Southern red oak----	70	
						Green ash-----------	---	
						Bur oak-------------	---	
14B, 14C2---------- Ava	2o	Slight	Slight	Slight	Slight	White oak-----------	75	Black walnut, eastern cottonwood, sweetgum, yellow-poplar, white oak, American sycamore.
						Northern red oak----	80	
						Yellow-poplar-------	90	
						Black walnut--------	---	
15C2--------------- Parke	1o	Slight	Slight	Slight	Slight	White oak-----------	90	Eastern white pine, red pine, black walnut, yellow-poplar, white ash, black locust.
						Yellow-poplar-------	98	
						Sweetgum------------	76	
16----------------- Rushville	---	--------	--------	--------	--------		---	Pin oak, green ash, European larch.
46----------------- Herrick	---	--------	--------	--------	--------		---	Eastern white pine, American sycamore, eastern cottonwood, green ash, northern red oak, sweetgum, white oak.
48----------------- Ebbert	---	--------	--------	--------	--------		---	Pin oak, green ash, water tupelo.
50----------------- Virden	---	--------	--------	--------	--------		---	Pin oak, green ash, European larch.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Trees to plant
70----------------- Beaucoup	2w	Slight	Severe	Moderate	Moderate	Pin oak-------------	90	Eastern cottonwood, red maple, American sycamore, sweetgum, pin oak.
						Eastern cottonwood--	100	
						Sweetgum------------	---	
						Cherrybark oak------	---	
						American sycamore---	---	
77A, 77B----------- Huntsville	1o	Slight	Slight	Slight	Slight	Eastern cottonwood--	110	Eastern cottonwood, black walnut, American sycamore, red maple, sugar maple, green ash, hackberry.
						American sycamore---	---	
						Yellow-poplar-------	98	
						Cherrybark oak------	---	
						Sweetgum------------	---	
						Green ash-----------	---	
112---------------- Cowden	---	--------	--------	--------	--------		---	Pin oak, green ash, water tupelo.
113A, 113B, 113B2-- Oconee	---	--------	--------	--------	--------		---	Shortleaf pine, loblolly pine, eastern white pine, eastern redcedar.
120---------------- Huey	4t	Slight	Severe	Severe	Moderate	Green ash-----------	60	Eastern redcedar, eastern white pine, green ash, osageorange.
						Eastern cottonwood--	---	
						White oak-----------	---	
128B--------------- Douglas	---	--------	--------	--------	--------		---	Black walnut, eastern white pine, green ash, loblolly pine, northern red oak, white ash, white oak, yellow-poplar.
164A, 164B, 164B2-- Stoy	3o	Slight	Slight	Slight	Slight	White oak-----------	70	Shortleaf pine, loblolly pine, eastern white pine, Scotch pine, eastern redcedar.
						Southern red oak----	70	
						White ash-----------	---	
						Bur oak-------------	---	
214B, 214C2-------- Hosmer	2o	Slight	Slight	Slight	Moderate	White oak-----------	75	Eastern white pine, shortleaf pine, red pine, yellow-poplar, white ash.
						Yellow-poplar-------	90	
						Virginia pine-------	75	
						Sugar maple---------	75	
218---------------- Newberry	---	--------	--------	--------	--------		---	Eastern cottonwood, red maple, American sycamore, sweetgum, pin oak.
242B--------------- Kendall	2o	Slight	Slight	Slight	Slight	White oak-----------	80	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine.
						Northern red oak----	80	
						Yellow-poplar-------	90	
						Black walnut--------	---	
287A--------------- Chauncey	3w	Slight	Severe	Moderate	Moderate	Pin oak-------------	80	Pin oak, green ash, water tupelo, red maple.
						White oak-----------	---	
						Green ash-----------	---	
						Yellow-poplar-------	80	
331---------------- Haymond	1o	Slight	Slight	Slight	Slight	Yellow-poplar-------	100	Eastern white pine, black walnut, yellow-poplar, black locust.
						White oak-----------	90	
						Black walnut--------	70	
333---------------- Wakeland	2o	Slight	Slight	Slight	Slight	Pin oak-------------	90	Eastern white pine, baldcypress, American sycamore, red maple, white ash.
						Sweetgum------------	88	
						Yellow-poplar-------	90	
						Virginia pine-------	85	

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordi- nation symbol	Management concerns: Erosion hazard	Management concerns: Equip- ment limita- tion	Management concerns: Seedling mortal- ity	Management concerns: Wind- throw hazard	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
334---------------- Birds	2w	Slight	Severe	Moderate	Slight	Eastern cottonwood-- Pin oak------------- Sweetgum------------ Cherrybark oak------ American sycamore---	100 90 --- --- ---	Eastern cottonwood, red maple, American sycamore, baldcypress, water tupelo.
337A--------------- Creal	3o	Slight	Slight	Slight	Slight	White oak----------- Southern red oak---- Green ash----------- Bur oak-------------	70 70 --- ---	Shortleaf pine, eastern white pine, loblolly pine, eastern redcedar.
404---------------- Titus	2w	Slight	Severe	Severe	Moderate	Eastern cottonwood-- White ash-----------	99 ---	Pin oak, swamp white oak, green ash, water tupelo, eastern cottonwood, American sycamore, hackberry, red maple, silver maple.
517A, 517B--------- Marine	3o	Slight	Slight	Moderate	Moderate	Post oak------------ Northern red oak---- Shagbark hickory----	70 70 ---	White oak, northern red oak, white ash, bur oak.
570C3-------------- Martinsville	1o	Slight	Slight	Slight	Slight	White oak----------- Yellow-poplar------- Sweetgum------------	90 98 76	Eastern white pine, red pine, white ash, yellow-poplar, black walnut.
581B2-------------- Tamalco	3t	Slight	Slight	Moderate	Slight	White oak----------- Black oak-----------	70 70	White oak, black oak, eastern white pine, green ash, eastern redcedar.
583B--------------- Pike	10	Slight	Slight	Slight	Slight	White oak----------- Yellow-poplar------- Sweetgum------------	90 98 76	Eastern white pine, red pine, black walnut, black locust, yellow-poplar, white ash.
585D--------------- Negley	1o	Slight	Slight	Slight	Slight	Yellow-poplar------- Northern red oak---- White oak----------- Black walnut-------- Black cherry-------- Sugar maple--------- White ash-----------	99 94 --- --- --- --- ---	Eastern white pine, black walnut, yellow-poplar, red pine, white ash, white oak, northern red oak.
620A, 620B3-------- Darmstadt	3t	Slight	Slight	Moderate	Slight	White oak----------- Black oak----------- Pignut hickory------	70 70 ---	Eastern white pine, white oak, green ash, eastern redcedar, osageorange.
912A*, 912B2*:								
Hoyleton-----------	3o	Slight	Slight	Slight	Slight	White oak----------- Northern red oak---- Green ash----------- Bur oak-------------	70 70 --- ---	Shortleaf pine, white oak, eastern white pine, eastern cottonwood, northern red oak, green ash.
Darmstadt----------	3t	Slight	Slight	Moderate	Slight	White oak----------- Black oak----------- Pignut hickory------	70 70 ---	Eastern white pine, white oak, green ash, eastern redcedar, osageorange.
914C3*:								
Atlas--------------	3c	Slight	Slight	Moderate	Moderate	White oak----------- Northern red oak---- Bur oak------------- Green ash-----------	70 70 70 ---	Red pine, Scotch pine, eastern redcedar, eastern white pine.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Trees to plant
914C3*:								
Grantfork	3t	Slight	Slight	Slight	Slight	Black oak	70	Eastern redcedar, eastern white pine, green ash, white ash.
						Post oak	---	
						Shagbark hickory	---	
916A*, 916B2*:								
Oconee	---	--------	--------	--------	--------		---	Shortleaf pine, loblolly pine, eastern white pine, eastern redcedar.
Darmstadt	3t	Slight	Slight	Moderate	Slight	White oak	70	Eastern white pine, white oak, green ash, eastern redcedar, osageorange.
						Black oak	70	
						Pignut hickory	---	
941*:								
Virden	---	--------	--------	--------	--------		---	Pin oak, green ash, European larch.
Piasa.								
946D3*:								
Hickory	1o	Slight	Slight	Slight	Slight	White oak	85	Eastern white pine, red pine, yellow-poplar, sugar maple, white oak, black walnut.
						Northern red oak	85	
						Black oak	---	
						Green ash	---	
						Bitternut hickory	---	
						Yellow-poplar	95	
Atlas	3c	Slight	Slight	Moderate	Moderate	White oak	70	Red pine, Scotch pine, eastern redcedar, eastern white pine.
						Northern red oak	70	
						Bur oak	70	
						Green ash	---	
967F*:								
Hickory	1r	Moderate	Moderate	Slight	Slight	White oak	85	Eastern white pine, red pine, yellow-poplar, sugar maple, white oak, black walnut.
						Northern red oak	85	
						Black oak	---	
						Green ash	---	
						Bitternut hickory	---	
						Yellow-poplar	95	
Gosport	5c	Moderate	Moderate	Severe	Severe	White oak	45	Eastern white pine, red pine, Norway spruce, Scotch pine, white spruce, cottonwood.
991*:								
Cisne	4w	Slight	Severe	Moderate	Moderate	Pin oak	70	Pin oak, green ash, water tupelo, red maple.
						White oak	---	
						Black oak	---	
						Bitternut hickory	---	
Huey	4t	Slight	Severe	Severe	Moderate	Green ash	60	Eastern redcedar, eastern white pine, green ash, osageorange.
						Eastern cottonwood	---	
						White oak	---	
993*:								
Cowden	---	--------	--------	--------	--------		---	Pin oak, green ash, water tupelo.
Piasa.								

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
995*:								
Herrick	---	---------	---------	---------	---------		---	Eastern white pine, American sycamore, eastern cottonwood, green ash, northern red oak, sweetgum, white oak.
Piasa.								

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

[The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil]

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
2. Cisne	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
3A, 3B, 3B2. Hoyleton	---	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, Tatarian honeysuckle, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
4B, 4C2. Richview	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
7C3. Atlas	---	American cranberrybush, Tatarian honeysuckle, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osageorange, green ash, Austrian pine.	Pin oak, eastern white pine.	---
8F. Hickory	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
12. Wynoose	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
13A, 13B, 13B2. Bluford	---	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, Tatarian honeysuckle, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
14B, 14C2 Ava	---	Washington hawthorn, Amur privet, eastern redcedar, Tatarian honeysuckle, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
15C2 Parke	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
16 Rushville	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
46 Herrick	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
48 Ebbert	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
50 Virden	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
70 Beaucoup	---	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
77A, 77B Huntsville	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
112 Cowden	Eastern white pine	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, northern white-cedar, blue spruce, Norway spruce, white fir.	---	Washington hawthorn, pin oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
113A, 113B, 113B2-Oconee	---	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, Tatarian honeysuckle, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
120-Huey	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
128B-Douglas	---	American cranberrybush, Amur honeysuckle, autumn-olive, silky dogwood.	Blue spruce, northern white-cedar, Washington hawthorn, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
164A, 164B, 164B2-Stoy	---	Washington hawthorn, Amur privet, eastern redcedar, Tatarian honeysuckle, Amur honeysuckle, arrowwood, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
214B, 214C2-Hosmer	---	Eastern redcedar, arrowwood, Washington hawthorn, Tatarian honeysuckle, Amur privet, American cranberrybush, Amur honeysuckle.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
218-Newberry	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
242B-Kendall	---	Amur privet, silky dogwood, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
284-Tice	---	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
287A-Chauncey	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of-- <8	8-15	16-25	26-35	>35
331 Haymond	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
333 Wakeland	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush, silky dogwood.	Northern white-cedar, Austrian pine, white fir, blue spruce, Washington hawthorn.	---	Eastern white pine, pin oak.
334 Birds	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
337A Creal	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
404 Titus	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
451 Lawson	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
474 Piasa	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
517A, 517B Marine	---	Eastern redcedar, American cranberrybush, Amur privet, Washington hawthorn, Amur honeysuckle, autumn-olive, Tatarian honeysuckle.	Austrian pine, green ash, eastern white pine, osageorange.	Pin oak	---
570C3 Martinsville	---	American cranberrybush, Amur honeysuckle, Amur privet, silky dogwood.	Blue spruce, northern white-cedar, Washington hawthorn, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
581B2 Tamalco	Tatarian honeysuckle.	Russian-olive, eastern redcedar.	Siberian elm, green ash.	---	---

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
583B-------------- Pike	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
585D-------------- Negley	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
620A, 620B3-------- Darmstadt	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
802*. Orthents					
865*. Pits					
912A*, 912B2*:					
Hoyleton---------	---	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, Tatarian honeysuckle, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
Darmstadt---------	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
914C3*:					
Atlas------------	---	American cranberrybush, Tatarian honeysuckle, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osageorange, green ash, Austrian pine.	Pin oak, eastern white pine.	---
Grantfork---------	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Green ash, Siberian elm.	---	---
916A*, 916B2*:					
Oconee-----------	---	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, Tatarian honeysuckle, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
Darmstadt---------	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of-- <8	8-15	16-25	26-35	>35
941*:					
Virden	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
Piasa	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
946D3*:					
Hickory	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Atlas	---	American cranberrybush, Tatarian honeysuckle, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osageorange, green ash, Austrian pine.	Pin oak, eastern white pine.	---
967F*:					
Hickory	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Gosport	---	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, Tatarian honeysuckle, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
991*:					
Cisne	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
Huey	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
993*:					
Cowden	Eastern white pine	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, northern white-cedar, blue spruce, Norway spruce, white fir.	---	Washington hawthorn, pin oak.
Piasa	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
995*:					
Herrick	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
Piasa	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2 Cisne	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
3A, 3B, 3B2 Hoyleton	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
4B Richview	Slight	Slight	Moderate: slope.	Slight	Slight.
4C2 Richview	Slight	Slight	Severe: slope.	Slight	Slight.
7C3 Atlas	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: slope, wetness, percs slowly.	Severe: wetness.	Severe: wetness.
8F Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
12 Wynoose	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
13A, 13B, 13B2 Bluford	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
14B Ava	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Slight	Slight.
14C2 Ava	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight	Slight.
15C2 Parke	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
16 Rushville	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
46 Herrick	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
48 Ebbert	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
50 Virden	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
70 Beaucoup	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
77A Huntsville	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
77B Huntsville	Severe: flooding.	Slight	Moderate: slope.	Slight	Slight.
112 Cowden	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
113A, 113B, 113B2 Oconee	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
120 Huey	Severe: wetness, percs slowly, excess sodium.	Severe: wetness, excess sodium, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: excess sodium, wetness.
128B Douglas	Slight	Slight	Moderate: slope.	Slight	Slight.
164A, 164B, 164B2 Stoy	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
214B Hosmer	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Slight.
214C2 Hosmer	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Slight.
218 Newberry	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
242B Kendall	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Severe: erodes easily.	Moderate: wetness.
284 Tice	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
287A Chauncey	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
331 Haymond	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
333 Wakeland	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
334 Birds	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
337A Creal	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
404 Titus	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
451 Lawson	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
474 Piasa	Severe: wetness, percs slowly, excess sodium.	Severe: wetness, excess sodium, percs slowly.	Severe: wetness, percs slowly, excess sodium.	Severe: wetness.	Severe: excess sodium, wetness.
517A, 517B Marine	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
570C3 Martinsville	Severe: flooding.	Slight	Severe: slope.	Slight	Slight.
581B2 Tamalco	Severe: percs slowly, excess sodium.	Severe: excess sodium, percs slowly.	Severe: percs slowly, excess sodium.	Slight	Severe: excess sodium.
583B Pike	Slight	Slight	Moderate: slope.	Slight	Slight.
585D Negley	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
620A, 620B3 Darmstadt	Severe: wetness, percs slowly, excess sodium.	Severe: excess sodium, percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Severe: excess sodium.
802*. Orthents					
865*. Pits					
912A*, 912B2*:					
Hoyleton	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Darmstadt	Severe: wetness, percs slowly, excess sodium.	Severe: excess sodium, percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Severe: excess sodium.
914C3*:					
Atlas	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: slope, wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Grantfork	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness.
916A*, 916B2*:					
Oconee	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Darmstadt	Severe: wetness, percs slowly, excess sodium.	Severe: excess sodium, percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Severe: excess sodium.
941*:					
Virden	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Piasa	Severe: wetness, percs slowly, excess sodium.	Severe: wetness, excess sodium, percs slowly.	Severe: wetness, percs slowly, excess sodium.	Severe: wetness.	Severe: excess sodium, wetness.
946D3*:					
Hickory	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
946D3*:					
Atlas	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: slope, wetness, percs slowly.	Severe: wetness.	Severe: wetness.
967F*:					
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Gosport	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Severe: slope.
991*:					
Cisne	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Huey	Severe: wetness, percs slowly, excess sodium.	Severe: wetness, excess sodium, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: excess sodium, wetness.
993*:					
Cowden	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Piasa	Severe: wetness, percs slowly, excess sodium.	Severe: wetness, excess sodium, percs slowly.	Severe: wetness, percs slowly, excess sodium.	Severe: wetness.	Severe: excess sodium, wetness.
995*:					
Herrick	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Piasa	Severe: wetness, percs slowly, excess sodium.	Severe: wetness, excess sodium, percs slowly.	Severe: wetness, percs slowly, excess sodium.	Severe: wetness.	Severe: excess sodium, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
2: Cisne	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
3A: Hoyleton	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
3B, 3B2: Hoyleton	Fair	Good	Good	Good	Fair	Poor	Good	Good	Poor.
4B: Richview	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
4C2: Richview	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
7C3: Atlas	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
8F: Hickory	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
12: Wynoose	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
13A: Bluford	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
13B, 13B2: Bluford	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
14B, 14C2: Ava	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
15C2: Parke	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
16: Rushville	Poor	Fair	Poor	Fair	Good	Good	Poor	Fair	Good.
46: Herrick	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
48: Ebbert	Poor	Fair	Fair	Poor	Good	Good	Fair	Poor	Good.
50: Virden	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
70: Beaucoup	Good	Good	Good	Fair	Good	Good	Good	Good	Good.
77A, 77B: Huntsville	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
112: Cowden	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
113A: Oconee	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
113B, 113B2: Oconee	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
120 Huey	Poor	Poor	Poor	Fair	Good	Good	Poor	Fair	Good.
128B Douglas	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
164A, 164B Stoy	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
164B2 Stoy	Fair	Good	Good	Good	Poor	Poor	Good	Good	Poor.
214B Hosmer	Fair	Good	Good	Good	Poor	Poor	Good	Good	Poor.
214C2 Hosmer	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
218 Newberry	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
242B Kendall	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
284 Tice	Poor	Fair	Fair	Good	Fair	Fair	Fair	Good	Fair.
287A Chauncey	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
331 Haymond	Good	Good	Fair	Good	Poor	Poor	Good	Good	Poor.
333 Wakeland	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
334 Birds	Good	Fair	Good	Good	Good	Good	Good	Good	Good.
337A Creal	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
404 Titus	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
451 Lawson	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
474 Piasa	Poor	Fair	Fair	Poor	Good	Good	Poor	Poor	Good.
517A Marine	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
517B Marine	Fair	Good	Good	Good	Poor	Poor	Good	Good	Poor.
570C3 Martinsville	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
581B2 Tamalco	Good	Good	Fair	Good	Poor	Poor	Good	Good	Poor.
583B Pike	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
585D Negley	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
620A---------------- Darmstadt	Fair	Good	Poor	Good	Fair	Fair	Fair	Good	Fair.
620B3--------------- Darmstadt	Fair	Good	Poor	Good	Fair	Poor	Fair	Good	Poor.
802*. Orthents									
865*. Pits									
912A*:									
Hoyleton-----------	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Darmstadt----------	Fair	Good	Poor	Good	Fair	Fair	Fair	Good	Fair.
912B2*:									
Hoyleton-----------	Fair	Good	Good	Good	Fair	Poor	Good	Good	Poor.
Darmstadt----------	Fair	Good	Poor	Good	Fair	Poor	Fair	Good	Poor.
914C3*:									
Atlas--------------	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Grantfork----------	Fair	Good	Fair	Good	Poor	Very poor	Fair	Good	Very poor.
916A*:									
Oconee-------------	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Darmstadt----------	Fair	Good	Poor	Good	Fair	Fair	Fair	Good	Fair.
916B2*:									
Oconee-------------	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Darmstadt----------	Fair	Good	Poor	Good	Fair	Poor	Fair	Good	Poor.
941*:									
Virden-------------	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Piasa--------------	Poor	Fair	Fair	Poor	Good	Good	Poor	Poor	Good.
946D3*:									
Hickory------------	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Atlas--------------	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
967F*:									
Hickory------------	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Gosport------------	Very poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor.
991*:									
Cisne--------------	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Huey---------------	Poor	Poor	Poor	Fair	Good	Good	Poor	Fair	Good.
993*:									
Cowden-------------	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
993*: Piasa---------------	Poor	Fair	Fair	Poor	Good	Good	Poor	Poor	Good.
995*: Herrick-------------	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Piasa---------------	Poor	Fair	Fair	Poor	Good	Good	Poor	Poor	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2----------------- Cisne	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, frost action.	Severe: wetness.
3A, 3B, 3B2-------- Hoyleton	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
4B----------------- Richview	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
4C2---------------- Richview	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
7C3---------------- Atlas	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness.	Severe: wetness.
8F----------------- Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
12----------------- Wynoose	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, frost action.	Severe: wetness.
13A, 13B, 13B2----- Bluford	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
14B---------------- Ava	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Slight.
14C2--------------- Ava	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength, frost action.	Slight.
15C2--------------- Parke	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
16----------------- Rushville	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding.
46----------------- Herrick	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
48----------------- Ebbert	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
50----------------- Virden	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
70 Beaucoup	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
77A Huntsville	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding, frost action.	Moderate: flooding.
77B Huntsville	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, frost action.	Slight.
112 Cowden	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Severe: wetness.
113A, 113B, 113B2 Oconee	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
120 Huey	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: excess sodium, wetness.
128B Douglas	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
164A, 164B, 164B2 Stoy	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
214B Hosmer	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell.	Severe: frost action.	Slight.
214C2 Hosmer	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell, slope.	Severe: frost action.	Slight.
218 Newberry	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
242B Kendall	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, frost action.	Moderate: wetness.
284 Tice	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.
287A Chauncey	Severe: wetness.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
331 Haymond	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, frost action.	Moderate: flooding.
333 Wakeland	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Moderate: wetness, flooding.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
334: Birds	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
337A: Creal	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
404: Titus	Severe: cutbanks cave, ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
451: Lawson	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Moderate: wetness, flooding.
474: Piasa	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, frost action.	Severe: excess sodium, wetness.
517A, 517B: Marine	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
570C3: Martinsville	Slight	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: low strength, flooding.	Slight.
581B2: Tamalco	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, frost action, shrink-swell.	Severe: excess sodium.
583B: Pike	Slight	Slight	Slight	Slight	Severe: low strength, frost action.	Slight.
585D: Negley	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
620A, 620B3: Darmstadt	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Severe: excess sodium.
802*. Orthents						
865*. Pits						
912A*, 912B2*: Hoyleton	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
Darmstadt	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Severe: excess sodium.
914C3*: Atlas	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness.	Severe: wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
914C3*:						
Grantfork	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
916A*, 916B2*:						
Oconee	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
Darmstadt	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Severe: excess sodium.
941*:						
Virden	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding.
Piasa	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, frost action.	Severe: excess sodium, wetness.
946D3*:						
Hickory	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Atlas	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, slope.	Severe: low strength, wetness.	Severe: wetness.
967F*:						
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Gosport	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
991*:						
Cisne	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, frost action.	Severe: wetness.
Huey	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: excess sodium, wetness.
993*:						
Cowden	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Severe: wetness.
Piasa	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, frost action.	Severe: excess sodium, wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
995*:						
Herrick	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
Piasa	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, frost action.	Severe: excess sodium, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
2-------------------- Cisne	Severe: wetness, percs slowly.	Slight------------	Severe: wetness.	Severe: wetness.	Poor: wetness.
3A------------------- Hoyleton	Severe: wetness, percs slowly.	Slight------------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
3B, 3B2-------------- Hoyleton	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
4B------------------- Richview	Severe: wetness.	Moderate: wetness, seepage, slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
4C2------------------ Richview	Severe: wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
7C3------------------ Atlas	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
8F------------------- Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
12------------------- Wynoose	Severe: wetness, percs slowly.	Slight------------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, wetness.
13A------------------ Bluford	Severe: wetness, percs slowly.	Slight------------	Severe: wetness.	Severe: wetness.	Poor: wetness.
13B, 13B2------------ Bluford	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
14B------------------ Ava	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
14C2----------------- Ava	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
15C2----------------- Parke	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
16------------------- Rushville	Severe: ponding, percs slowly.	Slight------------	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
46------------------- Herrick	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
48------------------- Ebbert	Severe: ponding, percs slowly.	Slight------------	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
50 Virden	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
70 Beaucoup	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
77A Huntsville	Severe: flooding.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Good.
77B Huntsville	Moderate: flooding, wetness, percs slowly.	Severe: flooding.	Severe: wetness.	Moderate: flooding, wetness.	Good.
112 Cowden	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
113A Oconee	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
113B, 113B2 Oconee	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
120 Huey	Severe: wetness, percs slowly.	Slight	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
128B Douglas	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Slight	Fair: too clayey.
164A Stoy	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
164B, 164B2 Stoy	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
214B Hosmer	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
214C2 Hosmer	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
218 Newberry	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
242B Kendall	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
284 Tice	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
287A----------------- Chauncey	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
331------------------ Haymond	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
333------------------ Wakeland	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
334------------------ Birds	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
337A----------------- Creal	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
404------------------ Titus	Severe: flooding, ponding, percs slowly.	Slight-----------	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
451------------------ Lawson	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
474------------------ Piasa	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
517A----------------- Marine	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
517B----------------- Marine	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
570C3---------------- Martinsville	Moderate: flooding, percs slowly.	Severe: slope.	Moderate: flooding, too clayey.	Moderate: flooding.	Fair: too clayey.
581B2---------------- Tamalco	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: too clayey, hard to pack, excess sodium.
583B----------------- Pike	Slight-----------	Moderate: seepage, slope.	Severe: seepage.	Slight-----------	Fair: too clayey.
585D----------------- Negley	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, small stones, slope.
620A----------------- Darmstadt	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
620B3: Darmstadt	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
802*. Orthents					
865*. Pits					
912A*:					
Hoyleton	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Darmstadt	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
912B2*:					
Hoyleton	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Darmstadt	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
914C3*:					
Atlas	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
Grantfork	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
916A*:					
Oconee	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Darmstadt	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
916B2*:					
Oconee	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Darmstadt	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
941*:					
Virden	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Piasa	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
946D3*:					
Hickory	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Atlas	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
967F*:					
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Gosport	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, hard to pack, slope.
991*:					
Cisne	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
Huey	Severe: wetness, percs slowly.	Slight	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
993*:					
Cowden	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Piasa	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
995*:					
Herrick	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Piasa	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
2 Cisne	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
3A, 3B, 3B2 Hoyleton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
4B, 4C2 Richview	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
7C3 Atlas	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
8F Hickory	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
12 Wynoose	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
13A, 13B, 13B2 Bluford	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
14B, 14C2 Ava	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
15C2 Parke	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
16 Rushville	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
46 Herrick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
48 Ebbert	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
50 Virden	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
70 Beaucoup	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
77A, 77B Huntsville	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
112 Cowden	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
113A, 113B, 113B2 Oconee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
120 Huey	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
128B------------------- Douglas	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
164A, 164B, 164B2----- Stoy	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
214B, 214C2----------- Hosmer	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
218------------------- Newberry	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
242B------------------ Kendall	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
284------------------- Tice	Fair: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
287A------------------ Chauncey	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
331------------------- Haymond	Good------------------	Improbable: excess fines.	Improbable: excess fines.	Good.
333------------------- Wakeland	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
334------------------- Birds	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
337A------------------ Creal	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
404------------------- Titus	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
451------------------- Lawson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
474------------------- Piasa	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
517A, 517B------------ Marine	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
570C3----------------- Martinsville	Good------------------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
581B2----------------- Tamalco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
583B------------------ Pike	Good------------------	Improbable: excess fines.	Improbable: excess fines.	Good.
585D------------------ Negley	Good------------------	Probable--------------	Probable--------------	Poor: small stones.
620A, 620B3----------- Darmstadt	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
802*. Orthents				
865*. Pits				
912A*, 912B2*:				
Hoyleton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Darmstadt	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
914C3*:				
Atlas	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Grantfork	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
916A*, 916B2*:				
Oconee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Darmstadt	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
941*:				
Virden	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Piasa	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
946D3*:				
Hickory	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey, slope.
Atlas	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
967F*:				
Hickory	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Gosport	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
991*:				
Cisne	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Huey	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
993*:				
Cowden	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Piasa	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
995*:				
Herrick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Piasa	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
2 Cisne	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
3A Hoyleton	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
3B, 3B2 Hoyleton	Moderate: slope.	Severe: wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
4B, 4C2 Richview	Moderate: seepage, slope.	Moderate: wetness.	Not needed	Slope	Erodes easily	Erodes easily.
7C3 Atlas	Moderate: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Wetness	Wetness.
8F Hickory	Severe: slope.	Severe: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
12 Wynoose	Slight	Severe: thin layer, wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
13A Bluford	Slight	Severe: piping, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
13B, 13B2 Bluford	Moderate: slope.	Severe: piping, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
14B, 14C2 Ava	Moderate: seepage, slope.	Severe: piping.	Percs slowly, frost action, slope.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness.	Erodes easily, rooting depth.
15C2 Parke	Severe: slope.	Slight	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
16 Rushville	Slight	Severe: hard to pack, ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
46 Herrick	Slight	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
48 Ebbert	Slight	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
50 Virden	Slight	Severe: hard to pack, ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
70 Beaucoup	Slight	Severe: ponding.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding	Wetness.
77A Huntsville	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Flooding	Favorable	Favorable.
77B Huntsville	Moderate: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Slope	Favorable	Favorable.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
112 Cowden	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
113A Oconee	Slight	Severe: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
113B, 113B2 Oconee	Moderate: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
120 Huey	Slight	Severe: wetness, excess sodium.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, excess sodium, erodes easily.
128B Douglas	Moderate: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Slope	Erodes easily	Erodes easily.
164A Stoy	Slight	Moderate: wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
164B, 164B2 Stoy	Moderate: slope.	Moderate: wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness.	Wetness, erodes easily.
214B, 214C2 Hosmer	Moderate: seepage, slope.	Severe: piping.	Percs slowly, frost action, slope.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness.	Erodes easily, rooting depth.
218 Newberry	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
242B Kendall	Moderate: seepage, slope.	Severe: thin layer, wetness.	Frost action, slope.	Wetness, slope, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
284 Tice	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Wetness	Wetness.
287A Chauncey	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
331 Haymond	Moderate: seepage.	Severe: piping.	Deep to water	Flooding	Erodes easily	Erodes easily.
333 Wakeland	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
334 Birds	Slight	Severe: ponding.	Ponding, flooding, frost action.	Ponding, erodes easily, flooding.	Erodes easily, ponding.	Wetness, erodes easily.
337A Creal	Slight	Severe: thin layer, wetness.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
404 Titus	Slight	Severe: ponding.	Ponding, percs slowly, flooding.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, rooting depth, percs slowly.
451 Lawson	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
474 Piasa	Slight	Severe: wetness, excess sodium, hard to pack.	Percs slowly, frost action, excess salt.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, excess sodium, erodes easily.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
517A------------- Marine	Slight---------	Moderate: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
517B------------- Marine	Moderate: slope.	Moderate: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
570C3------------ Martinsville	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
581B2------------ Tamalco	Moderate: slope.	Severe: hard to pack, excess sodium.	Deep to water	Percs slowly, slope.	Erodes easily, percs slowly.	Excess sodium, erodes easily.
583B------------- Pike	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
585D------------- Negley	Severe: seepage, slope.	Moderate: thin layer.	Deep to water	Slope----------	Slope----------	Slope.
620A------------- Darmstadt	Slight---------	Severe: excess sodium.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess salt.
620B3------------ Darmstadt	Moderate: slope.	Severe: excess sodium.	Percs slowly, frost action, slope.	Wetness, droughty, percs slowly.	Erodes easily, wetness.	Wetness, excess salt.
802*. Orthents						
865*. Pits						
912A*:						
Hoyleton---------	Slight---------	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Darmstadt--------	Slight---------	Severe: excess sodium.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess salt.
912B2*:						
Hoyleton---------	Moderate: slope.	Severe: wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Darmstadt--------	Moderate: slope.	Severe: excess sodium.	Percs slowly, frost action, slope.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess salt.
914C3*:						
Atlas------------	Moderate: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Wetness--------	Wetness.
Grantfork--------	Moderate: slope.	Moderate: piping, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness.	Wetness, erodes easily.
916A*:						
Oconee-----------	Slight---------	Severe: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Darmstadt--------	Slight---------	Severe: excess sodium.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess salt.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
916B2*:						
Oconee	Moderate: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Darmstadt	Moderate: slope.	Severe: excess sodium.	Percs slowly, frost action, slope.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess salt.
941*:						
Virden	Slight	Severe: hard to pack, ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
Piasa	Slight	Severe: wetness, excess sodium, hard to pack.	Percs slowly, frost action, excess salt.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, excess sodium, erodes easily.
946D3*:						
Hickory	Severe: slope.	Severe: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Atlas	Severe: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Slope, wetness.	Wetness, slope.
967F*:						
Hickory	Severe: slope.	Severe: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Gosport	Severe: slope.	Severe: hard to pack.	Deep to water	Percs slowly, depth to rock, rooting depth.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
991*:						
Cisne	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Huey	Slight	Severe: wetness, excess sodium.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, excess sodium, erodes easily.
993*:						
Cowden	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Piasa	Slight	Severe: wetness, excess sodium, hard to pack.	Percs slowly, frost action, excess salt.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, excess sodium, erodes easily.
995*:						
Herrick	Slight	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
Piasa	Slight	Severe: wetness, excess sodium, hard to pack.	Percs slowly, frost action, excess salt.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, excess sodium, erodes easily.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
2----------------- Cisne	0-16	Silt loam--------	CL, CL-ML, ML	A-4	0	100	100	90-100	90-100	25-35	5-10
	16-38	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	90-100	90-100	45-60	20-35
	38-46	Silty clay loam, sandy loam, silt loam.	CL	A-6, A-7	0-5	100	90-100	70-95	50-90	30-50	15-30
	46-60	Silt loam, loam, clay loam.	CL	A-6	0-5	100	90-100	70-95	50-90	25-40	10-25
3A, 3B, 3B2------ Hoyleton	0-7	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-35	5-15
	7-33	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	90-100	40-55	20-30
	33-60	Silt loam, loam, clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	95-100	90-100	70-95	20-45	5-25
4B, 4C2---------- Richview	0-13	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-35	5-15
	13-44	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	90-100	35-50	15-30
	44-60	Silt loam, loam, clay loam.	CL	A-6, A-7	0	100	90-100	90-100	80-95	25-45	10-20
7C3-------------- Atlas	0-5	Silty clay loam	CH, CL	A-7	0	100	100	95-100	80-95	45-65	30-50
	5-42	Silty clay loam, silty clay, clay loam.	CH	A-7	0	100	100	95-100	80-95	50-70	35-55
	42-60	Clay loam, loam	CH, CL	A-6, A-7	0-5	100	95-100	95-100	75-95	35-55	20-40
8F--------------- Hickory	0-12	Silt loam--------	CL	A-6, A-4	0-5	95-100	90-100	90-100	85-95	20-35	8-15
	12-46	Clay loam--------	CL	A-6, A-7	0-5	100	90-100	80-95	75-90	30-50	15-30
	46-60	Clay loam, sandy loam, loam.	CL-ML, CL	A-4, A-6	0-5	85-100	85-95	80-95	60-80	20-40	5-20
12--------------- Wynoose	0-22	Silt loam--------	CL-ML, CL, ML	A-4, A-6	0	100	100	95-100	85-95	20-35	2-15
	22-41	Silty clay, clay, silty clay loam.	CL, CH	A-7, A-6	0	100	95-100	95-100	85-95	35-55	15-30
	41-49	Silty clay loam, silt loam, clay loam.	CL, CL-ML	A-6, A-4	0	100	95-100	90-100	70-90	20-40	5-20
	49-60	Clay loam, loam	CL	A-6, A-7	0-10	95-100	90-100	90-100	70-90	20-45	10-25
13A, 13B--------- Bluford	0-8	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	95-100	95-100	90-100	20-35	5-15
	8-13	Silt loam--------	ML, CL-ML, CL	A-4	0	100	95-100	95-100	90-100	20-30	NP-10
	13-35	Silty clay loam, silty clay.	CL	A-7, A-6	0	100	95-100	95-100	90-100	35-50	15-30
	35-65	Silt loam, loam, clay loam.	CL-ML, CL	A-6, A-4	0-5	100	95-100	90-100	70-90	25-40	5-20
13B2------------- Bluford	0-8	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	95-100	95-100	90-100	20-35	5-15
	8-13	Silt loam--------	ML, CL-ML, CL	A-4	0	100	95-100	95-100	90-100	20-30	NP-10
	13-35	Silty clay loam, silty clay.	CL	A-7, A-6	0	100	95-100	95-100	90-100	35-50	15-30
	35-60	Silt loam, loam, clay loam.	CL-ML, CL	A-6, A-4	0-5	100	95-100	90-100	70-90	25-40	5-20
14B, 14C2-------- Ava	0-11	Silt loam--------	CL	A-6, A-4	0	100	100	95-100	90-100	25-35	8-15
	11-24	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	25-45	10-20
	24-38	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	25-45	10-20
	38-51	Silt loam, loam, clay loam.	CL, CL-ML	A-4, A-6, A-7	0	100	95-100	90-100	80-90	20-45	5-20
	51-60	Loam, silt loam, clay loam.	CL	A-4, A-6	0	100	95-100	90-100	80-90	25-40	7-20

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
15C2------------- Parke	0-7	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	25-35	5-15
	7-28	Silty clay loam, silt loam.	CL	A-6, A-7	0	95-100	95-100	90-100	80-100	25-45	10-25
	28-60	Clay loam, loam, sandy loam.	SC, CL	A-2, A-6	0-3	90-100	85-95	55-90	30-60	25-35	10-15
16--------------- Rushville	0-8	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	8-20	Silt loam, silt	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	20-40	NP-15
	20-60	Silty clay loam, silty clay.	ML, CH, MH	A-7	0	100	100	95-100	95-100	45-60	15-30
46--------------- Herrick	0-18	Silt loam--------	CL, ML	A-4, A-6	0	100	100	95-100	90-100	30-40	5-15
	18-60	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	45-60	25-40
48--------------- Ebbert	0-16	Silt loam--------	CL	A-6	0	100	100	95-100	85-100	30-40	10-15
	16-22	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	85-100	25-35	7-15
	22-54	Silty clay loam	CL, CH	A-7	0	100	100	95-100	85-100	40-55	25-35
	54-60	Silty clay loam, clay loam, loam.	CL	A-7, A-6	0	100	95-100	95-100	80-100	30-50	10-30
50--------------- Virden	0-12	Silt loam--------	CL	A-7, A-6	0	100	100	98-100	95-100	30-45	10-20
	12-50	Silty clay, silty clay loam.	CH, CL, MH, ML	A-7	0	100	100	98-100	95-100	40-55	15-25
	50-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	98-100	90-100	30-45	10-20
70--------------- Beaucoup	0-19	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-25
	19-43	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-30
	43-60	Stratified very fine sandy loam to silty clay loam.	CL, CL-ML	A-6, A-4	0	100	100	90-100	60-95	20-40	5-20
77A-------------- Huntsville	0-36	Silt loam--------	CL	A-6	0	100	98-100	90-100	85-100	25-40	10-25
	36-60	Silt loam, loam, sandy loam.	CL, ML, SM, SC	A-4, A-6	0	90-100	80-100	55-95	45-85	20-35	NP-15
77B-------------- Huntsville	0-19	Loam-------------	CL	A-6	0	100	98-100	90-100	85-100	25-40	10-25
	19-60	Silt loam, loam, sandy loam.	CL, ML, SM, SC	A-4, A-6	0	90-100	80-100	55-95	45-85	20-35	NP-15
112-------------- Cowden	0-8	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	8-16	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-35	5-15
	16-55	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	95-100	45-60	20-32
	55-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	95-100	30-40	10-20
113A, 113B, 113B2----------- Oconee	0-9	Silt loam--------	CL	A-6	0	100	100	95-100	90-100	25-40	10-20
	9-14	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	20-35	8-20
	14-41	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	90-100	40-60	20-35
	41-54	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	10-25
	54-70	Silt loam--------	CL	A-4, A-6	0	100	100	90-100	85-100	20-35	8-20
120-------------- Huey	0-7	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	85-95	20-35	5-15
	7-13	Silt loam--------	CL, ML, CL-ML	A-6, A-4	0	100	100	90-100	85-95	15-30	3-15
	13-42	Silt loam, silty clay loam, silty clay.	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	15-30
	42-60	Loam, silt loam, silty clay loam.	CL	A-6	0	95-100	90-100	80-95	65-90	20-35	10-20

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
128B---------- Douglas	0-11	Silt loam--------	CL, ML	A-4, A-6	0	100	100	100	100	25-35	7-15
	11-43	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	100	100	30-45	10-20
	43-60	Silt loam, clay loam, sandy loam.	CL-ML, SM-SC, CL, SC	A-4, A-6, A-7	0	100	95-100	50-90	35-85	20-45	5-25
164A, 164B, 164B2---------- Stoy	0-12	Silt loam--------	ML, CL	A-6	0	100	100	95-100	90-100	30-40	10-15
	12-39	Silty clay loam	CL	A-7	0	100	100	95-100	90-100	40-50	22-32
	39-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	35-50	15-25
214B, 214C2------ Hosmer	0-10	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	90-100	70-90	<25	3-10
	10-22	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	25-35	5-15
	22-60	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	20-30	5-15
218-------------- Newberry	0-6	Silt loam--------	CL	A-6	0	100	100	95-100	85-100	30-40	10-20
	6-19	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	85-100	30-40	8-15
	19-43	Silty clay loam	CL, CH	A-7, A-6	0	100	100	95-100	85-100	35-55	15-30
	43-60	Silty clay loam, clay loam, loam.	CL	A-7, A-6	0-5	95-100	90-100	75-100	50-90	30-45	15-25
242B------------ Kendall	0-7	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	85-95	20-35	5-15
	7-12	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	85-95	15-30	5-15
	12-41	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-95	30-45	10-20
	41-60	Stratified sandy loam to silt loam.	CL-ML, SM-SC, CL, SC	A-2, A-4	0-5	98-100	80-90	60-90	30-70	15-25	4-10
284-------------- Tice	0-17	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	80-95	30-45	10-20
	17-53	Silty clay loam	CL, CH	A-7	0	100	100	95-100	85-95	40-55	15-30
	53-60	Stratified silty clay loam to fine sand.	CL-ML, CL	A-4, A-6, A-7	0	100	100	60-95	55-80	25-45	5-20
287A------------ Chauncey	0-13	Silt loam--------	CL, ML	A-6, A-4	0	100	100	90-100	90-100	25-35	7-15
	13-28	Silt loam--------	CL-ML, CL	A-4	0	100	100	90-100	90-100	20-30	5-10
	28-50	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	90-100	90-100	40-55	20-35
	50-60	Silty clay loam, clay loam, silt loam.	ML, CL	A-6, A-7	0-5	95-100	95-100	90-100	80-95	35-45	10-20
331-------------- Haymond	0-10	Silt loam--------	ML	A-4	0	100	100	90-100	80-90	27-36	4-10
	10-60	Fine sandy loam, silt loam, loam.	ML, SM	A-4	0	95-100	90-100	80-100	35-90	27-36	4-10
333-------------- Wakeland	0-10	Silt loam--------	ML	A-4	0	100	100	90-100	80-90	27-36	4-10
	10-60	Silt loam--------	ML	A-4	0	100	100	90-100	80-90	27-36	4-10
334-------------- Birds	0-8	Silt loam--------	CL	A-4, A-6	0	100	95-100	90-100	80-100	24-34	8-15
	8-60	Silt loam--------	CL	A-4, A-6	0	100	95-100	90-100	80-100	24-34	8-15
337A------------- Creal	0-25	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	95-100	95-100	80-100	25-36	6-17
	25-53	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	95-100	95-100	90-100	38-50	15-26
	53-60	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	90-100	90-100	80-100	20-33	5-15
404-------------- Titus	0-20	Silty clay loam	CH, CL	A-7	0	100	100	95-100	90-100	40-55	20-30
	20-50	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	40-55	20-30
	50-60	Stratified silty clay loam to sand.	CL, SM-SC, SC, CL-ML	A-6, A-4	0	100	90-100	50-90	45-85	20-40	5-25
451-------------- Lawson	0-28	Silt loam--------	CL, CL-ML	A-4	0	100	100	90-100	80-100	20-30	5-10
	28-60	Silty clay loam, silt loam.	CL	A-6	0	100	100	90-100	80-100	20-40	10-25

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
474 Piasa	0-8	Silt loam	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	30-45	8-20
	8-11	Silt loam	CL	A-4, A-6	0	100	100	95-100	90-100	25-40	8-20
	11-54	Silty clay, silty clay loam.	CL, ML, MH, CH	A-7	0	100	100	95-100	95-100	40-60	20-40
	54-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-25
517A, 517B Marine	0-16	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	20-35	5-15
	16-49	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	95-100	40-60	20-35
	49-60	Silty clay loam, silt loam.	CL	A-4, A-6, A-7	0	100	100	95-100	80-100	30-45	8-20
570C3 Martinsville	0-6	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	85-95	22-33	4-12
	6-10	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4	0	100	100	90-100	85-95	20-35	5-20
	10-41	Clay loam, sandy clay loam.	CL, CL-ML, SC, SM-SC	A-6, A-4	0	100	90-100	65-90	40-90	20-35	5-20
	41-60	Sandy loam, loam	ML, CL, SM, SC	A-4, A-6, A-2	0	100	90-100	60-80	30-60	30-40	5-15
581B2 Tamalco	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	8-29	Silty clay loam, silty clay.	CH	A-7	0	100	100	95-100	95-100	55-75	35-45
	29-46	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	95-100	30-50	15-25
	46-60	Silt loam, loam, clay loam.	CL	A-6	0	100	100	95-100	80-100	30-40	15-25
583B Pike	0-11	Silt loam	CL	A-4, A-6	0	100	100	90-100	80-95	25-35	8-15
	11-54	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	85-100	80-90	30-45	10-25
	54-60	Silty clay loam, silt loam, sandy clay loam.	CL, SC	A-6, A-2-6	0	80-90	70-90	60-90	30-80	20-35	10-20
585D Negley	0-10	Silt loam	ML, CL-ML	A-4, A-6	0	85-100	80-95	70-90	55-85	25-40	4-12
	10-55	Loam, clay loam, gravelly sandy loam.	SM, ML	A-4, A-2, A-6, A-7	0-5	70-95	65-85	45-80	25-65	25-45	3-17
	55-70	Gravelly sandy clay loam, sandy clay loam, sandy clay.	SM-SC, SC	A-2, A-4, A-7, A-6	0-5	70-95	65-85	35-80	25-50	20-50	5-24
620A Darmstadt	0-10	Silt loam	CL	A-6, A-7	0	95-100	95-100	95-100	75-100	25-45	10-20
	10-35	Silty clay loam, silty clay.	CL, CH	A-7	0	100	95-100	95-100	90-100	40-65	20-40
	35-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	95-100	95-100	90-100	75-100	20-50	7-30
620B3 Darmstadt	0-7	Silty clay loam	CL, CH	A-6, A-7	0	100	95-100	95-100	90-100	35-55	15-35
	7-50	Silty clay loam, silty clay.	CL, CH	A-7	0	100	95-100	95-100	90-100	40-65	20-40
	50-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	95-100	95-100	90-100	75-100	20-50	7-30
802*. Orthents											
865*. Pits											
912A*, 912B2*: Hoyleton	0-16	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-35	5-15
	16-60	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	90-100	40-55	20-30

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
912A*, 912B2*:											
Darmstadt-------	0-15	Silt loam--------	CL	A-6, A-7	0	95-100	95-100	95-100	75-100	25-45	10-20
	15-55	Silty clay loam, silty clay.	CL, CH	A-7	0	100	95-100	95-100	90-100	40-65	20-40
	55-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	95-100	95-100	90-100	75-100	20-50	7-30
914C3*:											
Atlas-----------	0-5	Silty clay loam	CH, CL	A-7	0	100	100	95-100	80-95	45-65	30-50
	5-54	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	95-100	80-95	50-70	35-55
	54-60	Clay loam, loam	CH, CL	A-6, A-7	0-5	100	95-100	95-100	75-95	35-55	20-40
Grantfork-------	0-3	Silty clay loam	CL	A-6	0	100	95-100	85-95	80-90	25-40	10-20
	3-41	Silty clay loam, clay loam, loam.	CL	A-6, A-7	0	100	90-100	80-90	70-80	30-45	10-20
	41-60	Clay loam, loam	CL	A-6, A-7	0-5	95-100	85-95	70-80	55-75	25-45	10-25
916A*, 916B2*:											
Oconee----------	0-9	Silt loam--------	CL	A-6	0	100	100	95-100	90-100	25-40	10-20
	9-19	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	20-35	8-20
	19-40	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	90-100	40-60	20-35
	40-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	10-25
Darmstadt-------	0-16	Silt loam--------	CL	A-6, A-7	0	95-100	95-100	95-100	75-100	25-45	10-20
	16-45	Silty clay loam, silty clay.	CL, CH	A-7	0	100	95-100	95-100	90-100	40-65	20-40
	45-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	95-100	95-100	90-100	75-100	20-50	7-30
941*:											
Virden----------	0-16	Silt loam--------	CL	A-7, A-6	0	100	100	98-100	95-100	30-45	10-20
	16-40	Silty clay, silty clay loam.	CH, CL, MH, ML	A-7	0	100	100	98-100	95-100	40-55	15-25
	40-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	98-100	90-100	30-45	10-20
Piasa-----------	0-9	Silt loam--------	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	30-45	8-20
	9-14	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	25-40	8-20
	14-33	Silty clay, silty clay loam.	CL, ML, MH, CH	A-7	0	100	100	95-100	95-100	40-60	20-40
	33-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-25
946D3*:											
Hickory---------	0-6	Clay loam--------	CL	A-6, A-7	0-5	95-100	90-100	80-95	75-90	30-50	15-30
	6-35	Clay loam--------	CL	A-6, A-7	0-5	100	90-100	80-95	75-90	30-50	15-30
	35-60	Clay loam, sandy loam, loam.	CL-ML, CL	A-4, A-6	0-5	85-100	85-95	80-95	60-80	20-40	5-20
Atlas-----------	0-6	Silty clay loam	CH, CL	A-7	0	100	100	95-100	80-95	45-65	30-50
	6-48	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	95-100	80-95	50-70	35-55
	48-60	Clay loam, loam	CH, CL	A-6, A-7	0-5	100	95-100	95-100	75-95	35-55	20-40
967F*:											
Hickory---------	0-17	Loam-------------	CL	A-6, A-4	0-5	95-100	90-100	90-100	85-95	20-35	8-15
	17-54	Clay loam--------	CL	A-6, A-7	0-5	100	90-100	80-95	75-90	30-50	15-30
	54-60	Clay loam, sandy loam, loam.	CL-ML, CL	A-4, A-6	0-5	85-100	85-95	80-95	60-80	20-40	5-20
Gosport---------	0-5	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	25-40	5-15
	5-34	Clay, silty clay	CH	A-7	0	100	100	95-100	85-100	50-65	35-50
	34-60	Weathered bedrock	CH	A-7	0	100	100	95-100	85-100	65-80	50-60

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
991*:											
Cisne-----------	0-21	Silt loam--------	CL, CL-ML, ML	A-4	0	100	100	90-100	90-100	25-35	5-10
	21-43	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	90-100	90-100	45-60	20-35
	43-50	Silty clay loam, sandy loam, silt loam.	CL	A-6, A-7	0-5	100	90-100	70-95	50-90	30-50	15-30
	50-60	Silt loam, loam, clay loam.	CL	A-6	0-5	100	90-100	70-95	50-90	25-40	10-25
Huey------------	0-7	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	85-95	20-35	5-15
	7-50	Silt loam, silty clay loam, silty clay.	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	15-30
	50-60	Loam, silt loam, silty clay loam.	CL	A-6	0	95-100	90-100	80-95	65-90	20-35	10-20
993*:											
Cowden----------	0-8	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	8-16	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-35	5-15
	16-55	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	95-100	45-60	20-32
	55-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	95-100	30-40	10-20
Piasa-----------	0-8	Silt loam--------	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	30-45	8-20
	8-11	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	25-40	8-20
	11-60	Silty clay, silty clay loam.	CL, ML, MH, CH	A-7	0	100	100	95-100	95-100	40-60	20-40
995*:											
Herrick---------	0-15	Silt loam--------	CL, ML	A-4, A-6	0	100	100	95-100	90-100	30-40	5-15
	15-56	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	45-60	25-40
	56-60	Silt loam, loam, clay loam.	CL	A-6	0	100	100	90-100	80-95	30-40	10-20
Piasa-----------	0-11	Silt loam--------	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	30-45	8-20
	11-15	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	25-40	8-20
	15-60	Silty clay, silty clay loam.	CL, ML, MH, CH	A-7	0	100	100	95-100	95-100	40-60	20-40

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	G/cm^3	In/hr	In/in	pH					Pct
2---------------- Cisne	0-16	15-27	1.30-1.50	0.06-0.6	0.22-0.24	4.5-7.3	Low-----------	0.37	3	6	1-3
	16-38	35-45	1.40-1.60	<0.06	0.09-0.15	4.5-6.0	High----------	0.37			
	38-46	25-37	1.50-1.70	<0.06	0.08-0.14	5.1-6.5	Moderate------	0.37			
	46-60	22-30	1.60-1.80	<0.06	0.14-0.22	5.6-7.3	Moderate------	0.37			
3A, 3B, 3B2------ Hoyleton	0-7	20-27	1.30-1.50	0.6-2.0	0.22-0.24	3.6-7.3	Moderate------	0.32	3	6	1-3
	7-33	35-45	1.40-1.65	0.06-0.2	0.13-0.20	3.6-5.5	High----------	0.43			
	33-60	15-33	1.35-1.70	0.06-0.2	0.17-0.22	5.1-6.5	Moderate------	0.43			
4B, 4C2----------- Richview	0-13	20-27	1.20-1.40	0.6-2.0	0.22-0.24	4.5-6.5	Low-----------	0.32	5	6	1-3
	13-44	27-35	1.30-1.50	0.6-2.0	0.18-0.20	4.5-6.5	Moderate------	0.43			
	44-60	22-35	1.50-1.70	0.6-2.0	0.14-0.20	4.5-6.5	Moderate------	0.43			
7C3-------------- Atlas	0-5	30-40	1.45-1.65	0.06-0.2	0.18-0.20	4.5-7.3	High----------	0.32	2	7	.5-2
	5-42	35-45	1.50-1.70	<0.06	0.09-0.13	4.5-7.3	High----------	0.32			
	42-60	20-30	1.55-1.75	0.06-0.2	0.12-0.15	6.1-7.8	Moderate------	0.32			
8F--------------- Hickory	0-12	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.37	5	6	1-2
	12-46	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-5.5	Moderate------	0.37			
	46-60	15-22	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low-----------	0.37			
12--------------- Wynoose	0-22	15-22	1.30-1.50	0.2-0.6	0.18-0.22	3.6-5.5	Moderate------	0.43	3	6	.5-2
	22-41	35-42	1.40-1.60	<0.06	0.09-0.13	3.6-5.5	High----------	0.43			
	41-49	25-37	1.50-1.70	0.06-0.2	0.08-0.14	3.6-6.0	Moderate------	0.43			
	49-60	20-35	1.60-1.80	0.06-0.2	0.14-0.16	4.5-6.0	Moderate------	0.43			
13A, 13B---------- Bluford	0-8	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low-----------	0.43	3	6	1-3
	8-13	15-25	1.40-1.60	0.2-0.6	0.18-0.20	3.6-6.0	Low-----------	0.43			
	13-35	35-42	1.45-1.65	0.2-0.6	0.11-0.20	3.6-5.5	Moderate------	0.43			
	35-65	22-35	1.60-1.70	0.06-0.2	0.11-0.16	3.6-6.5	Moderate------	0.43			
13B2------------- Bluford	0-8	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low-----------	0.43	3	6	1-3
	8-13	15-25	1.40-1.60	0.2-0.6	0.18-0.20	3.6-6.0	Low-----------	0.43			
	13-35	35-42	1.45-1.65	0.2-0.6	0.11-0.20	3.6-5.5	Moderate------	0.43			
	35-60	22-35	1.60-1.70	0.06-0.2	0.11-0.16	3.6-6.5	Moderate------	0.43			
14B, 14C2--------- Ava	0-11	20-27	1.30-1.50	0.6-2.0	0.20-0.23	3.6-7.3	Low-----------	0.43	4	6	.5-2
	11-24	22-33	1.40-1.60	0.6-2.0	0.18-0.21	3.6-5.5	Moderate------	0.43			
	24-38	24-35	1.50-1.70	0.2-0.6	0.18-0.21	3.6-5.5	Moderate------	0.43			
	38-51	20-30	1.65-1.80	<0.06	0.09-0.11	3.6-5.5	Low-----------	0.43			
	51-60	20-30	1.55-1.75	0.2-0.6	0.15-0.18	4.5-6.0	Low-----------	0.43			
15C2------------- Parke	0-7	18-27	1.25-1.40	0.6-2.0	0.22-0.24	5.1-6.5	Low-----------	0.37	5-4	5	.5-2
	7-28	22-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-5.5	Moderate------	0.37			
	28-60	20-30	1.55-1.65	0.6-2.0	0.16-0.18	4.5-5.5	Low-----------	0.28			
16--------------- Rushville	0-8	15-27	1.25-1.45	0.2-0.6	0.22-0.24	4.5-7.3	Low-----------	0.43	3	6	1-3
	8-20	10-25	1.30-1.50	0.06-0.2	0.15-0.20	4.5-6.5	Low-----------	0.43			
	20-60	35-45	1.40-1.60	<0.2	0.11-0.20	4.5-7.8	High----------	0.43			
46--------------- Herrick	0-18	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-6.5	Moderate------	0.28	5	6	3-4
	18-60	35-42	1.20-1.40	0.2-0.6	0.12-0.17	4.5-6.5	High----------	0.43			
48--------------- Ebbert	0-16	20-30	1.20-1.40	0.2-0.6	0.22-0.24	5.1-6.5	Low-----------	0.37	5	6	2-3
	16-22	18-25	1.30-1.50	0.2-0.6	0.20-0.22	5.1-6.0	Low-----------	0.37			
	22-54	27-35	1.35-1.55	0.06-0.2	0.18-0.20	4.5-7.3	Moderate------	0.37			
	54-60	22-33	1.50-1.70	0.06-0.2	0.14-0.20	5.6-7.3	Moderate------	0.37			
50--------------- Virden	0-12	25-30	1.20-1.40	0.6-2.0	0.21-0.24	5.6-7.8	Moderate------	0.28	5	4	4-6
	12-50	35-42	1.20-1.45	0.2-0.6	0.11-0.20	5.6-7.3	High----------	0.28			
	50-60	25-33	1.25-1.55	0.2-0.6	0.18-0.22	6.1-8.4	Moderate------	0.28			
70--------------- Beaucoup	0-19	27-35	1.25-1.45	0.2-0.6	0.21-0.23	5.6-7.8	Moderate------	0.32	5	7	5-6
	19-43	27-35	1.30-1.50	0.2-0.6	0.18-0.20	5.6-7.8	Moderate------	0.32			
	43-60	10-30	1.40-1.65	0.2-0.6	0.18-0.22	6.1-8.4	Moderate------	0.32			

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	G/cm^3	In/hr	In/in	pH					Pct
77A-------------- Huntsville	0-36	18-27	1.15-1.35	0.6-2.0	0.22-0.24	6.1-7.3	Moderate-----	0.28	5	6	3-4
	36-60	15-25	1.20-1.50	0.6-2.0	0.12-0.21	6.1-7.8	Low----------	0.28			
77B-------------- Huntsville	0-19	18-27	1.15-1.35	0.6-2.0	0.22-0.24	6.1-7.3	Moderate-----	0.28	5	6	3-4
	19-60	15-25	1.20-1.50	0.6-2.0	0.12-0.21	6.1-7.8	Low----------	0.28			
112-------------- Cowden	0-8	17-27	1.20-1.40	0.2-0.6	0.22-0.24	5.6-7.3	Low----------	0.37	3	6	2-3
	8-16	17-27	1.25-1.45	0.2-0.6	0.18-0.20	4.5-6.0	Low----------	0.37			
	16-55	35-45	1.35-1.60	0.06-0.2	0.12-0.20	4.5-7.3	High---------	0.37			
	55-60	20-27	1.50-1.70	0.2-0.6	0.17-0.22	5.6-7.8	Moderate-----	0.37			
113A, 113B, 113B2----------- Oconee	0-9	20-27	1.20-1.30	0.2-0.6	0.22-0.24	5.6-7.3	Moderate-----	0.32	3-2	6	2-3
	9-14	18-27	1.30-1.45	0.06-0.2	0.20-0.22	5.1-6.5	Moderate-----	0.43			
	14-41	35-45	1.30-1.50	0.06-0.2	0.11-0.17	4.5-6.0	High---------	0.43			
	41-54	20-35	1.40-1.60	0.06-0.2	0.16-0.21	5.1-6.5	Moderate-----	0.43			
	54-70	17-27	1.40-1.60	0.06-0.2	0.20-0.22	5.6-8.4	Moderate-----	0.43			
120-------------- Huey	0-7	15-27	1.35-1.50	0.2-0.6	0.22-0.24	5.1-7.3	Low----------	0.43	2	6	1-3
	7-13	11-25	1.40-1.55	0.06-0.2	0.20-0.22	5.1-7.8	Low----------	0.43			
	13-42	25-35	1.45-1.65	<0.06	0.05-0.08	7.4-9.0	Moderate-----	0.43			
	42-60	18-35	1.55-1.75	0.06-0.2	0.10-0.15	6.6-8.4	Moderate-----	0.43			
128B------------- Douglas	0-11	14-27	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5-4	5	2-4
	11-43	25-35	1.25-1.40	0.6-2.0	0.18-0.22	5.1-6.0	Moderate-----	0.43			
	43-60	10-30	1.45-1.70	0.6-6.0	0.11-0.22	5.6-7.3	Moderate-----	0.43			
164A, 164B, 164B2----------- Stoy	0-12	20-27	1.20-1.40	0.2-0.6	0.22-0.24	4.5-6.0	Low----------	0.43	4	6	1-2
	12-39	25-35	1.35-1.55	0.06-0.2	0.18-0.20	4.5-5.5	Moderate-----	0.43			
	39-60	25-35	1.55-1.75	0.06-0.2	0.09-0.12	4.5-5.5	Moderate-----	0.43			
214B, 214C2------ Hosmer	0-10	10-17	1.20-1.40	0.6-2.0	0.22-0.24	4.5-6.5	Low----------	0.43	4	5	1-2
	10-22	24-30	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Moderate-----	0.43			
	22-60	16-26	1.60-1.70	<0.06	0.06-0.08	4.5-6.0	Low----------	0.43			
218-------------- Newberry	0-6	20-27	1.25-1.50	0.2-0.6	0.22-0.24	5.6-7.3	Low----------	0.37	3	6	2-3
	6-19	18-25	1.30-1.55	0.2-0.6	0.20-0.22	4.5-6.0	Low----------	0.37			
	19-43	27-35	1.30-1.55	0.06-0.2	0.18-0.20	4.5-6.0	Moderate-----	0.37			
	43-60	22-33	1.50-1.70	0.06-0.2	0.14-0.20	4.5-6.5	Moderate-----	0.37			
242B------------- Kendall	0-7	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-2
	7-12	18-25	1.25-1.45	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.37			
	12-41	27-35	1.30-1.50	0.6-2.0	0.18-0.20	4.5-7.3	Moderate-----	0.37			
	41-60	10-25	1.55-1.70	0.6-2.0	0.11-0.20	5.6-8.4	Low----------	0.37			
284-------------- Tice	0-17	22-35	1.25-1.45	0.6-2.0	0.21-0.24	6.1-7.8	Moderate-----	0.32	5	7	2-3
	17-53	27-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.32			
	53-60	15-30	1.40-1.60	0.6-2.0	0.11-0.18	6.1-7.8	Moderate-----	0.32			
287A------------- Chauncey	0-13	15-22	1.20-1.40	0.6-2.0	0.22-0.24	4.5-6.5	Low----------	0.37	3	6	2-4
	13-28	15-22	1.25-1.50	0.2-0.6	0.20-0.22	4.5-6.0	Low----------	0.37			
	28-50	35-42	1.35-1.60	0.06-0.2	0.11-0.15	4.5-6.0	High---------	0.37			
	50-60	22-35	1.50-1.70	0.06-0.2	0.14-0.18	5.6-7.3	Moderate-----	0.37			
331-------------- Haymond	0-10	10-18	1.30-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	5	1-3
	10-60	10-18	1.30-1.45	0.6-2.0	0.20-0.22	6.1-7.3	Low----------	0.37			
333-------------- Wakeland	0-10	10-17	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	5	1-3
	10-60	10-17	1.30-1.50	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.37			
334-------------- Birds	0-8	15-25	1.20-1.40	0.2-0.6	0.22-0.24	5.6-7.8	Low----------	0.43	5	6	1-3
	8-60	18-27	1.40-1.60	0.2-0.6	0.20-0.22	5.1-7.8	Low----------	0.43			
337A------------- Creal	0-25	20-27	1.30-1.50	0.2-0.6	0.22-0.24	3.6-7.3	Low----------	0.37	5	6	1-3
	25-53	25-35	1.35-1.60	0.2-0.6	0.18-0.20	4.5-6.5	Moderate-----	0.37			
	53-60	18-27	1.40-1.60	0.2-0.6	0.20-0.22	4.5-7.3	Low----------	0.37			

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	G/cm^3	In/hr	In/in	pH					Pct
404-------------- Titus	0-20	35-45	1.30-1.50	0.06-0.2	0.11-0.22	6.1-7.8	High----------	0.32	4	4	5-6
	20-50	35-45	1.30-1.50	0.06-0.2	0.11-0.22	6.1-7.8	High----------	0.32			
	50-60	5-30	1.45-1.75	0.2-0.6	0.10-0.20	6.1-7.8	Moderate------	0.32			
451-------------- Lawson	0-28	10-20	1.20-1.55	0.6-2.0	0.22-0.24	6.1-7.8	Low-----------	0.32	5	5	3-5
	28-60	18-30	1.55-1.65	0.6-2.0	0.18-0.20	6.1-7.8	Moderate------	0.43			
474-------------- Piasa	0-8	18-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Moderate------	0.37	3	6	2-4
	8-11	18-27	1.30-1.50	0.06-0.2	0.18-0.20	5.6-7.8	Moderate------	0.37			
	11-54	35-43	1.35-1.55	<0.06	0.09-0.10	6.1-9.0	High----------	0.37			
	54-60	20-35	1.50-1.70	0.06-0.2	0.10-0.12	7.4-9.0	Moderate------	0.37			
517A, 517B------- Marine	0-16	9-18	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low-----------	0.37	3	5	1-2
	16-49	35-48	1.45-1.70	0.06-0.2	0.11-0.18	4.5-6.0	High----------	0.37			
	49-60	15-35	1.45-1.65	0.2-0.6	0.18-0.22	5.1-6.5	Moderate------	0.37			
570C3------------ Martinsville	0-6	15-27	1.20-1.40	0.6-2.0	0.22-0.24	5.6-7.3	Low-----------	0.37	5	6	1-3
	6-10	18-30	1.30-1.50	0.6-2.0	0.18-0.20	5.1-6.0	Moderate------	0.37			
	10-41	18-30	1.40-1.60	0.6-2.0	0.15-0.19	5.1-6.0	Moderate------	0.37			
	41-60	15-25	1.50-1.65	0.6-2.0	0.11-0.16	5.6-7.3	Low-----------	0.37			
581B2------------ Tamalco	0-8	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low-----------	0.43	3	6	2-3
	8-29	35-45	1.35-1.60	<0.06	0.09-0.14	4.5-7.8	High----------	0.43			
	29-46	20-35	1.50-1.70	<0.06	0.07-0.11	7.4-9.0	Moderate------	0.43			
	46-60	20-30	1.55-1.75	<0.06	0.02-0.12	7.4-9.0	Moderate------	0.43			
583B------------- Pike	0-11	18-27	1.25-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low-----------	0.37	5-4	5	.5-2
	11-54	22-35	1.30-1.45	0.6-2.0	0.18-0.22	4.5-5.5	Low-----------	0.37			
	54-60	18-35	1.30-1.45	0.6-2.0	0.12-0.18	4.5-5.5	Low-----------	0.37			
585D------------- Negley	0-10	12-25	1.30-1.50	2.0-6.0	0.16-0.22	4.5-7.3	Low-----------	0.32	3	5	1-3
	10-55	18-35	1.30-1.60	0.6-2.0	0.10-0.16	4.5-6.5	Low-----------	0.32			
	55-70	22-38	1.20-1.60	0.6-2.0	0.06-0.14	4.5-6.0	Low-----------	0.32			
620A------------- Darmstadt	0-10	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low-----------	0.43	3	6	.5-2
	10-35	27-35	1.40-1.65	<0.06	0.09-0.10	4.5-7.8	Moderate------	0.43			
	35-60	15-25	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low-----------	0.43			
620B3------------ Darmstadt	0-7	27-35	1.35-1.55	0.06-0.2	0.12-0.17	4.5-7.3	Moderate------	0.43	2	7	.5-1
	7-50	27-35	1.40-1.65	<0.06	0.09-0.10	4.5-7.8	Moderate------	0.43			
	50-60	15-25	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low-----------	0.43			
802*. Orthents											
865*. Pits											
912A*, 912B2*:											
Hoyleton--------	0-16	20-27	1.30-1.50	0.6-2.0	0.22-0.24	3.6-5.5	Moderate------	0.32	3	6	1-3
	16-60	35-45	1.40-1.65	0.06-0.2	0.13-0.20	3.6-5.5	High----------	0.43			
Darmstadt-------	0-15	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low-----------	0.43	3	6	.5-2
	15-55	27-35	1.40-1.65	<0.06	0.09-0.10	4.5-7.8	Moderate------	0.43			
	55-60	15-25	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low-----------	0.43			
914C3*:											
Atlas-----------	0-5	30-40	1.45-1.65	0.06-0.2	0.18-0.20	4.5-7.3	High----------	0.32	2	7	.5-2
	5-54	35-45	1.50-1.70	<0.06	0.09-0.13	4.5-7.3	High----------	0.32			
	54-60	20-30	1.55-1.75	0.06-0.2	0.15-0.19	6.1-7.8	Moderate------	0.32			
Grantfork-------	0-3	20-30	1.35-1.55	0.2-0.6	0.15-0.20	4.5-7.8	Low-----------	0.37	4	7	.5-1
	3-41	20-30	1.40-1.60	0.2-0.6	0.15-0.20	5.1-9.0	Low-----------	0.37			
	41-60	20-30	1.65-1.80	0.06-0.2	0.07-0.10	7.4-9.0	Moderate------	0.37			
916A*, 916B2*:											
Oconee----------	0-9	20-27	1.20-1.30	0.2-0.6	0.22-0.24	5.6-7.3	Moderate------	0.32	3-2	6	2-3
	9-19	18-27	1.30-1.45	0.06-0.2	0.20-0.22	5.1-6.5	Moderate------	0.43			
	19-40	35-45	1.30-1.50	0.06-0.2	0.11-0.17	4.5-6.0	High----------	0.43			
	40-60	20-35	1.40-1.60	0.06-0.2	0.16-0.21	5.1-6.5	Moderate------	0.43			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH					Pct
916A*, 916B2*:											
Darmstadt-------	0-16	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low----------	0.43	3	6	.5-2
	16-45	27-35	1.40-1.65	<0.06	0.09-0.10	4.5-7.8	Moderate-----	0.43			
	45-60	15-25	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low----------	0.43			
941*:											
Virden----------	0-16	25-30	1.20-1.40	0.6-2.0	0.21-0.24	5.6-7.8	Moderate-----	0.28	5	4	4-6
	16-40	35-42	1.20-1.45	0.2-0.6	0.11-0.20	5.6-7.3	High---------	0.28			
	40-60	25-33	1.25-1.55	0.2-0.6	0.18-0.22	6.1-8.4	Moderate-----	0.28			
Piasa-----------	0-9	18-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Moderate-----	0.37	3	6	2-4
	9-14	18-27	1.30-1.50	0.06-0.2	0.18-0.20	5.6-7.8	Moderate-----	0.37			
	14-33	35-43	1.35-1.55	<0.06	0.09-0.10	6.1-9.0	High---------	0.37			
	33-60	20-35	1.50-1.70	0.06-0.2	0.10-0.12	7.4-9.0	Moderate-----	0.37			
946D3*:											
Hickory---------	0-6	27-35	1.40-1.65	0.6-2.0	0.17-0.19	4.5-6.0	Moderate-----	0.37	4	4	.5-1
	6-35	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-5.5	Moderate-----	0.37			
	35-60	15-22	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low----------	0.37			
Atlas-----------	0-6	30-40	1.45-1.65	0.06-0.2	0.18-0.20	4.5-7.3	High---------	0.32	2	7	.5-2
	6-48	35-45	1.50-1.70	<0.06	0.09-0.13	4.5-7.3	High---------	0.32			
	48-60	20-30	1.55-1.75	0.06-0.2	0.15-0.19	6.1-7.8	Moderate-----	0.32			
967F*:											
Hickory---------	0-17	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.37	5	6	1-2
	17-54	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-5.5	Moderate-----	0.37			
	54-60	15-22	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low----------	0.37			
Gosport---------	0-5	18-27	1.30-1.40	0.2-0.6	0.18-0.20	5.1-6.5	Low----------	0.43	3	6	1-2
	5-34	40-60	1.50-1.60	<0.06	0.12-0.14	3.6-5.5	High---------	0.32			
	34-60	40-75	1.70-1.90	<0.06	0.08-0.10	4.0-5.0	High---------	----			
991*:											
Cisne-----------	0-21	15-27	1.30-1.50	0.06-0.6	0.22-0.24	4.5-7.3	Low----------	0.37	3	6	1-3
	21-43	35-45	1.40-1.60	<0.06	0.09-0.15	4.5-6.0	High---------	0.37			
	43-50	25-37	1.50-1.70	<0.06	0.08-0.14	5.1-6.5	Moderate-----	0.37			
	50-60	22-30	1.60-1.80	<0.06	0.14-0.22	5.6-7.3	Moderate-----	0.37			
Huey------------	0-7	15-27	1.35-1.50	0.2-0.6	0.22-0.24	5.1-7.3	Low----------	0.43	2	6	1-3
	7-50	25-35	1.45-1.65	<0.06	0.05-0.08	7.4-9.0	Moderate-----	0.43			
	50-60	18-35	1.55-1.75	0.06-0.2	0.10-0.15	6.6-8.4	Moderate-----	0.43			
993*:											
Cowden----------	0-8	17-27	1.20-1.40	0.2-0.6	0.22-0.24	5.6-7.3	Low----------	0.37	3	6	2-3
	8-16	17-27	1.25-1.45	0.2-0.6	0.18-0.20	4.5-6.0	Low----------	0.37			
	16-55	35-45	1.35-1.60	0.06-0.2	0.12-0.20	4.5-7.3	High---------	0.37			
	55-60	20-27	1.50-1.70	0.2-0.6	0.17-0.22	5.6-7.8	Moderate-----	0.37			
Piasa-----------	0-8	18-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Moderate-----	0.37	3	6	2-4
	8-11	18-27	1.30-1.50	0.06-0.2	0.18-0.20	5.6-7.8	Moderate-----	0.37			
	11-60	35-43	1.35-1.55	<0.06	0.09-0.10	6.1-9.0	High---------	0.37			
995*:											
Herrick---------	0-15	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-6.5	Moderate-----	0.28	5	6	3-4
	15-56	35-42	1.20-1.40	0.2-0.6	0.12-0.17	4.5-6.0	High---------	0.43			
	56-60	20-30	1.30-1.50	0.2-0.6	0.16-0.21	5.6-8.4	Moderate-----	0.43			
Piasa-----------	0-11	18-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Moderate-----	0.37	3	6	2-4
	11-15	18-27	1.30-1.50	0.06-0.2	0.18-0.20	5.6-7.8	Moderate-----	0.37			
	15-60	35-43	1.35-1.53	<0.06	0.09-0.10	6.1-9.0	High---------	0.37			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
2----------------- Cisne	D	None---------	---	---	0-2.0	Perched	Feb-Jun	>60	---	High------	High------	Moderate.
3A, 3B, 3B2-------- Hoyleton	C	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High------	High------	High.
4B, 4C2------------ Richview	C	None---------	---	---	3.5-6.0	Apparent	Feb-May	>60	---	High------	Moderate	High.
7C3---------------- Atlas	D	None---------	---	---	0-2.0	Perched	Apr-Jun	>60	---	High------	High------	Moderate.
8F----------------- Hickory	C	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
12----------------- Wynoose	D	None---------	---	---	0-2.0	Apparent	Mar-Jun	>60	---	High------	High------	High.
13A, 13B, 13B2----- Bluford	D	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High------	High------	High.
14B, 14C2---------- Ava	C	None---------	---	---	2.0-4.0	Perched	Mar-Jun	>60	---	High------	Moderate	High.
15C2--------------- Parke	B	None---------	---	---	>6.0	---	---	>60	---	High------	Moderate	High.
16----------------- Rushville	D	None---------	---	---	+1-1.0	Perched	Mar-Jun	>60	---	High------	High------	High.
46----------------- Herrick	B	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High------	High------	High.
48----------------- Ebbert	C/D	None---------	---	---	+.5-2.0	Apparent	Apr-Jul	>60	---	High------	High------	Moderate.
50----------------- Virden	B/D	None---------	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High------	High------	Moderate.
70----------------- Beaucoup	B/D	Frequent-----	Brief------	Mar-Jun	+.5-2.0	Apparent	Mar-Jun	>60	---	High------	High------	Low.
77A---------------- Huntsville	B	Occasional	Brief------	Apr-Jun	4.0-6.0	Apparent	Mar-Jun	>60	---	High------	Low-------	Low.
77B---------------- Huntsville	B	Rare---------	---	---	4.0-6.0	Apparent	Mar-Jun	>60	---	High------	Low-------	Low.
112---------------- Cowden	D	None---------	---	---	0-2.0	Apparent	Mar-Jun	>60	---	High------	High------	Moderate.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
113A, 113B, 113B2-- Oconee	C	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	High.
120----------------- Huey	D	None--------	---	---	0-2.0	Perched	Mar-Jun	>60	---	High-----	High-----	Low.
128B---------------- Douglas	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
164A, 164B, 164B2-- Stoy	D	None--------	---	---	1.0-3.0	Perched	Feb-Apr	>60	---	High-----	High-----	High.
214B, 214C2-------- Hosmer	C	None--------	---	---	2.5-3.0	Perched	Mar-Apr	>60	---	High-----	Moderate	High.
218----------------- Newberry	C	None--------	---	---	0-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	High.
242B---------------- Kendall	B	Rare--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
284----------------- Tice	B	Occasional	Brief-----	Jan-Jun	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
287A---------------- Chauncey	C	None--------	---	---	0-2.0	Perched	Feb-Jun	>60	---	High-----	High-----	High.
331----------------- Haymond	B	Occasional	Brief-----	Jan-May	>6.0	---	---	>60	---	High-----	Low------	Low.
333----------------- Wakeland	B/D	Occasional	Brief-----	Jan-May	1.0-3.0	Apparent	Jan-Apr	>60	---	High-----	High-----	Low.
334----------------- Birds	C/D	Frequent----	Long------	Mar-Jun	+.5-1.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
337A---------------- Creal	C	None--------	---	---	1.0-3.0	Apparent	Feb-May	>60	---	High-----	High-----	High.
404----------------- Titus	B/D	Frequent----	Brief-----	Mar-Jun	+.5-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
451----------------- Lawson	C	Occasional	Brief-----	Mar-Jun	1.0-3.0	Apparent	Nov-May	>60	---	High-----	Moderate	Low.
474----------------- Piasa	D	None--------	---	---	0-2.0	Perched	Feb-May	>60	---	High-----	High-----	High.
517A, 517B-------- Marine	D	None--------	---	---	1.0-2.0	Perched	Jan-May	>60	---	High-----	High-----	High.
570C3-------------- Martinsville	B	Rare--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
581B2-------------- Tamalco	D	None--------	---	---	3.0-5.0	Apparent	Feb-Apr	>60	---	High-----	High-----	Low.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
583B: Pike	B	None	---	---	>6.0	---	---	>60	---	High	Low	High.
585D: Negley	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
620A, 620B3: Darmstadt	D	None	---	---	1.0-3.0	Perched	Feb-May	>60	---	High	High	High.
802*. Orthents												
865*. Pits												
912A*, 912B2*:												
Hoyleton	C	None	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High	High	High.
Darmstadt	D	None	---	---	1.0-3.0	Perched	Feb-May	>60	---	High	High	High.
914C3*:												
Atlas	D	None	---	---	0-2.0	Perched	Apr-Jun	>60	---	High	High	Moderate.
Grantfork	D	None	---	---	1.0-3.0	Perched	Jan-May	>60	---	High	High	Low.
916A*, 916B2*:												
Oconee	C	None	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High	High	High.
Darmstadt	D	None	---	---	1.0-3.0	Perched	Feb-May	>60	---	High	High	High.
941*:												
Virden	B/D	None	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High	High	Moderate.
Piasa	D	None	---	---	0-2.0	Perched	Feb-May	>60	---	High	High	High.
946D3*:												
Hickory	C	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
Atlas	D	None	---	---	0-2.0	Perched	Apr-Jun	>60	---	High	High	Moderate.
967F*:												
Hickory	C	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
Gosport	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	High.
991*:												
Cisne	D	None	---	---	0-2.0	Perched	Feb-Jun	>60	---	High	High	Moderate.
Huey	D	None	---	---	0-2.0	Perched	Mar-Jun	>60	---	High	High	Low.
993*:												
Cowden	D	None	---	---	0-2.0	Apparent	Mar-Jun	>60	---	High	High	Moderate.
Piasa	D	None	---	---	0-2.0	Perched	Feb-May	>60	---	High	High	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
995*:												
Herrick	B	None	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High	High	High.
Piasa	D	None	---	---	0-2.0	Perched	Feb-May	>60	---	High	High	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--ENGINEERING INDEX TEST DATA

Soil name and location	Parent material	Illinois report number S78--	Depth	Moisture density: Maximum density	Moisture density: Optimum moisture	Percentage passing sieve--: No. 4	Percentage passing sieve--: No. 10	Percentage passing sieve--: No. 40	Percentage passing sieve--: No. 200	Percentage smaller than--: 0.05 mm	Percentage smaller than--: 0.02 mm	Percentage smaller than--: 0.005 mm	Percentage smaller than--: 0.002 mm	Liquid limit	Plasticity index	Classification: AASHTO	Classification: Unified
			In	Lb/cu ft	Pct									Pct			
Birds silt loam: About 1,914 feet west and 1,188 feet north of the southeast corner of sec. 27, T. 6. N., R. 3 W.	Silty alluvium.	3-1-1	0-8	114	15	100	99	96	84	80	64	27	20	30	10	A-6(7)	CL
		3-1-2	23-60	114	15	99	99	96	86	84	67	31	28	30	12	A-6(9)	CL
Bluford silt loam: About 1,287 feet south and 106 feet east of the northwest corner of sec. 11, T. 4 N., R. 3 W.	Loess over glacial drift.	3-2-1	0-8	106	16	---	100	97	93	91	63	22	16	28	5	A-4(4)	ML
		3-2-2	18-25	104	20	---	100	100	99	94	76	40	34	48	26	A-7-6 (29)	CL
		3-2-3	52-65	117	12	99	98	95	79	71	54	27	21	28	12	A-6(7)	CL
Chauncey silt loam: About 50 feet north and 115 feet east of the southwest corner of sec. 20, T. 4 N., R. 3 W.	Loess.	3-3-1	0-10	103	17	---	100	99	98	95	72	24	18	32	8	A-4(8)	ML
		3-3-2	13-19	108	16	---	100	94	92	90	73	26	18	27	5	A-4(4)	ML
		3-3-3	28-34	93	25	---	100	99	97	94	83	47	42	55	31	A-7-6 (34)	CH
		3-3-4	63-72	112	15	---	100	99	91	88	68	27	23	36	18	A-6(16)	CL
Darmstadt silt loam: About 1,320 feet south and 450 feet east of the northwest corner of sec. 30, T. 7 N., R. 3 W.	Loess.	3-4-1	0-7	103	18	---	100	99	96	94	75	32	28	36	14	A-6(14)	CL
		3-4-2	18-27	94	22	---	100	100	99	97	88	51	43	56	35	A-7-6 (39)	CH
		3-4-3	48-60	120	12	---	100	95	77	71	50	22	15	22	7	A-4(3)	CL
Ebbert silt loam: About 1,310 feet north and 1,330 feet east of the southwest corner of sec. 20, T. 6 N., R. 3 W.	Loess.	3-5-1	0-6	98	21	---	100	100	98	97	83	41	29	39	15	A-6(17)	CL
		3-5-2	22-31	105	19	---	100	99	97	95	80	46	38	53	32	A-7-6 (35)	CH
		3-5-3	54-60	108	15	---	100	100	97	94	64	30	23	34	14	A-6(14)	CL
Hoyleton silt loam: About 2,690 feet south and 1,651 feet east of the northwest corner	Loess over glacial drift.	3-6-1	0-7	106	18	---	100	96	92	89	63	26	20	31	9	A-4(8)	CL
		3-6-2	15-23	95	23	---	100	100	99	97	83	44	37	48	24	A-7-6 (27)	CL
		3-6-3	41-60	119	12	100	99	97	74	70	50	22	17	22	6	A-4(2)	CL-ML

TABLE 18.--ENGINEERING INDEX TEST DATA--Continued

Soil name and location	Parent material	Illinois report number S78—	Depth	Moisture density: Maximum density	Moisture density: Optimum moisture	Percentage passing sieve--: No. 4	No. 10	No. 40	No. 200	Percentage smaller than--: 0.05 mm	0.02 mm	0.005 mm	0.002 mm	Liquid limit	Plasticity index	Classification: AASHTO	Unified
			In	Lb/cu ft	Pct									Pct			
Newberry silt loam: About 50 feet north and 750 feet west of the southeast corner of sec. 34, T. 5 N., R. 2 W.	Loess over glacial drift.	3-7-1	0-6	104	19	---	100	98	97	94	68	30	23	34	11	A-6(12)	CL
		3-7-2	19-32	101	20	100	100	97	96	94	80	39	33	38	15	A-6(15)	CL
		3-7-3	52-65	106	16	100	99	92	81	76	62	34	30	40	22	A-7(17)	CL
Piasa silt loam: About 40 feet south and 2,343 feet west of the northeast corner of sec. 19, T. 6 N., R. 3 W.	Loess.	3-9-1	0-8	101	20	---	100	99	97	95	79	33	21	34	10	A-4(10)	ML
		3-9-2	19-29	103	19	---	100	100	99	98	86	51	41	57	37	A-7-6 (41)	CH
Wynoose silt loam: About 625 feet east and 175 feet south of the center of sec. 1, T. 6 N., R. 2 W.	Loess over glacial drift.	3-10-1	0-2	108	17	100	99	95	88	84	65	22	15	22	3	A-4(1)	ML
		3-10-2	17-20	100	21	100	99	98	95	94	83	50	43	52	30	A-7-6 (32)	CH
		3-10-3	49-60	115	14	99	97	91	72	70	54	27	22	32	16	A-6(9)	CL

TABLE 19.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Atlas	Fine, montmorillonitic, mesic, sloping Aeric Ochraqualfs
Ava	Fine-silty, mixed, mesic Typic Fragiudalfs
Beaucoup	Fine-silty, mixed, mesic Fluvaquentic Haplaquolls
Birds	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
Bluford	Fine, montmorillonitic, mesic Aquic Hapludalfs
Chauncey	Fine, montmorillonitic, mesic Typic Argialbolls
Cisne	Fine, montmorillonitic, mesic Mollic Albaqualfs
Cowden	Fine, montmorillonitic, mesic Mollic Albaqualfs
Creal	Fine-silty, mixed, mesic Aquic Hapludalfs
Darmstadt	Fine-silty, mixed, mesic Albic Natraqualfs
Douglas	Fine-silty, mixed, mesic Typic Argiudolls
Ebbert	Fine-silty, mixed, mesic Argiaquic Argialbolls
*Gosport	Fine, illitic, mesic Typic Dystrochrepts
Grantfork	Fine-loamy, mixed, nonacid, mesic, sloping Aeric Haplaquepts
Haymond	Coarse-silty, mixed, nonacid, mesic Typic Udifluvents
Herrick	Fine, montmorillonitic, mesic Aquic Argiudolls
Hickory	Fine-loamy, mixed, mesic Typic Hapludalfs
Hosmer	Fine-silty, mixed, mesic Typic Fragiudalfs
Hoyleton	Fine, montmorillonitic, mesic Aquollic Hapludalfs
Huey	Fine-silty, mixed, mesic Typic Natraqualfs
Huntsville	Fine-silty, mixed, mesic Cumulic Hapludolls
Kendall	Fine-silty, mixed, mesic Aeric Ochraqualfs
Lawson	Fine-silty, mixed, mesic Cumulic Hapludolls
Marine	Fine, montmorillonitic, mesic Aeric Albaqualfs
Martinsville	Fine-loamy, mixed, mesic Typic Hapludalfs
Negley	Fine-loamy, mixed, mesic Typic Paleudalfs
Newberry	Fine-silty, mixed, mesic Mollic Ochraqualfs
Oconee	Fine, montmorillonitic, mesic Udollic Ochraqualfs
Orthents	Loamy, mixed, mesic Udorthents
Parke	Fine-silty, mixed, mesic Ultic Hapludalfs
Piasa	Fine, montmorillonitic, mesic Typic Natralbolls
Pike	Fine-silty, mixed, mesic Ultic Hapludalfs
Richview	Fine-silty, mixed, mesic Mollic Hapludalfs
Rushville	Fine, montmorillonitic, mesic Typic Albaqualfs
Stoy	Fine-silty, mixed, mesic Aquic Hapludalfs
Tamalco	Fine, montmorillonitic, mesic Typic Natrudalfs
Tice	Fine-silty, mixed, mesic Fluvaquentic Hapludolls
Titus	Fine, montmorillonitic, mesic Fluvaquentic Haplaquolls
Virden	Fine, montmorillonitic, mesic Typic Argiaquolls
Wakeland	Coarse-silty, mixed, nonacid, mesic Aeric Fluvaquents
Wynoose	Fine, montmorillonitic, mesic Typic Albaqualfs

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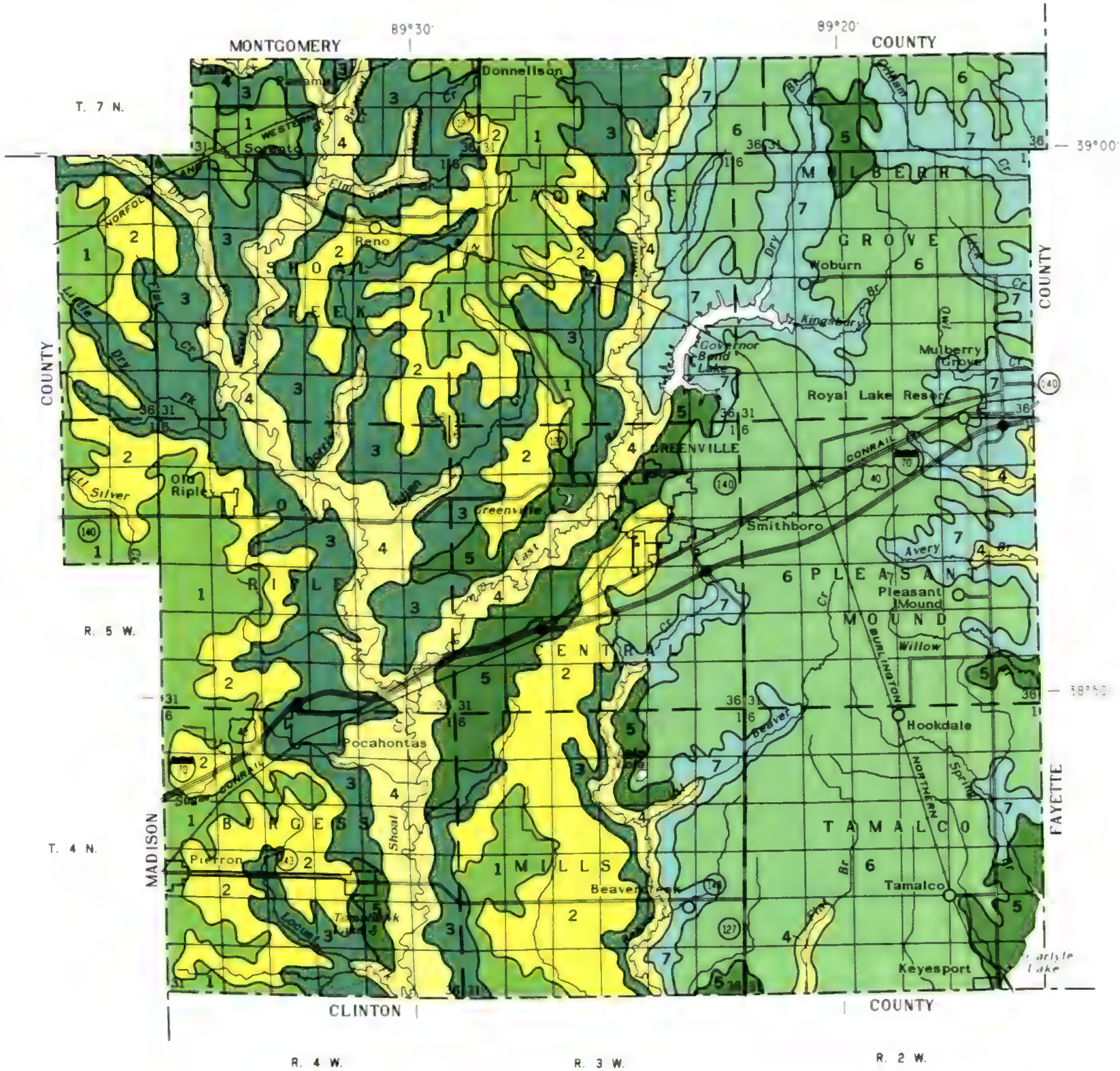
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ILLINOIS AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP
BOND COUNTY, ILLINOIS

Scale 1:190,080



SOIL LEGEND

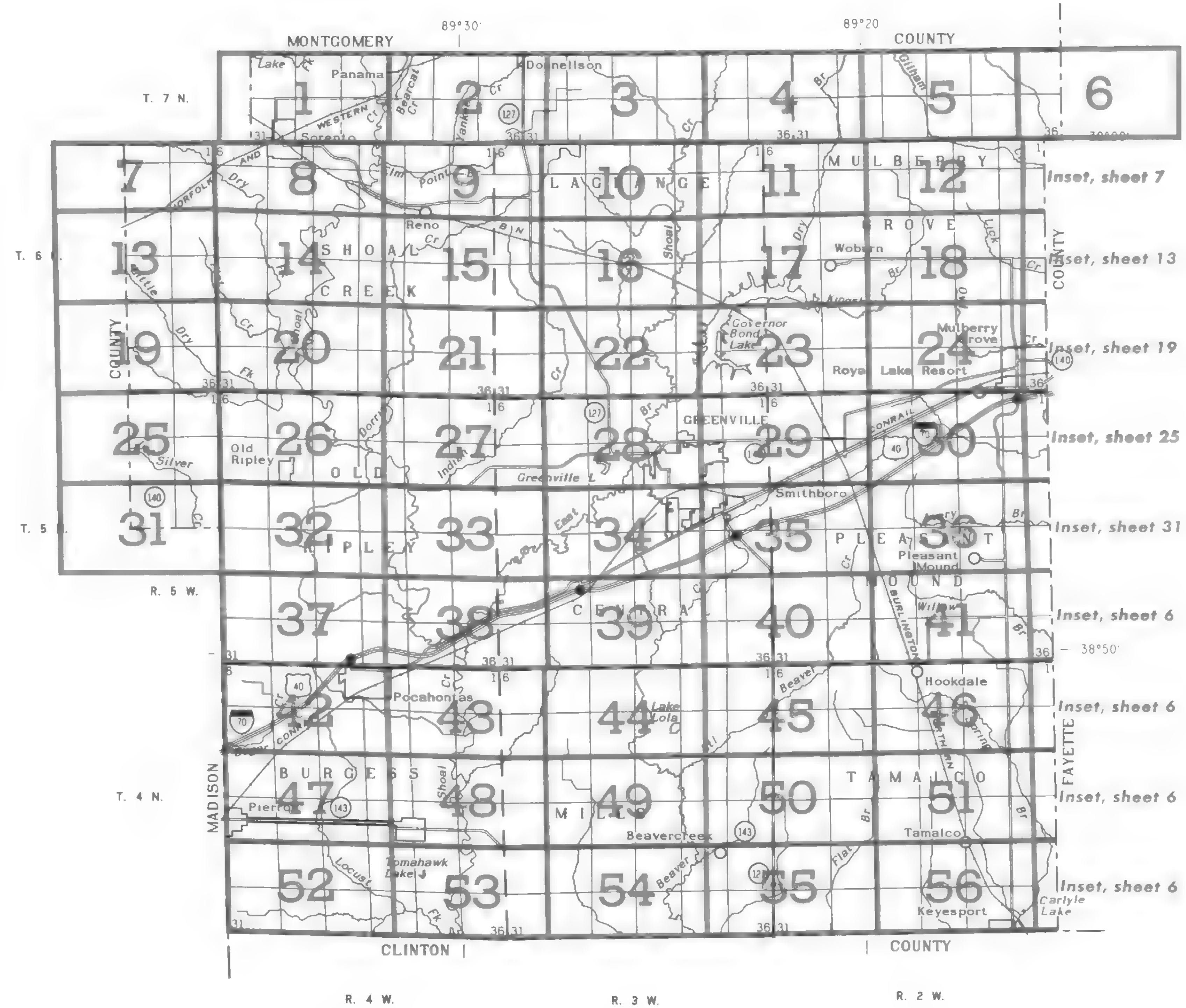
1	Piasa-Cowden association: Nearly level, poorly drained soils that have a very slowly permeable or slowly permeable subsoil and formed in loess; on uplands
2	Oconee-Darmstadt association: Nearly level or gently sloping, somewhat poorly drained soils that have a slowly permeable or very slowly permeable subsoil and formed in loess; on uplands
3	Hickory-Marine-Hosmer association: Nearly level to steep, well drained to somewhat poorly drained soils that have a moderately permeable, slowly permeable, or very slowly permeable subsoil and formed in glacial till or loess; on uplands
4	Wakeland-Lawson association: Nearly level, somewhat poorly drained soils that have a moderately permeable subsoil and formed in silty alluvium; on occasionally flooded bottom land
5	Ava-Hickory-Parke association: Gently sloping to steep, moderately well drained or well drained soils that have a very slowly permeable or moderately permeable subsoil and formed in glacial till or in loess and glacial drift; on uplands
6	Hoyleton-Cisne-Huey association: Nearly level or gently sloping, somewhat poorly drained or poorly drained soils that have a slowly permeable or very slowly permeable subsoil and formed in loess and glacial drift; on uplands
7	Bluford-Hickory-Atlas association: Nearly level to steep, somewhat poorly drained or well drained soils that have a slowly permeable, moderately permeable, or very slowly permeable subsoil and formed in loess or silty sediments and the underlying glacial till or in glacial till; on uplands

Compiled 1982

SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



INDEX TO MAP SHEETS
BOND COUNTY, ILLINOIS

Scale 1:190,080

1 0 1 2 3 4 Miles

1 0 1 2 3 4 5 6 Kilometers

Original text from each individual map sheet read:
This map is compiled on 1974 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

SOIL LEGEND

Map symbols consist of numbers or a combination of numbers and a letter. The initial numbers represent the kind of soil. A capital letter following these numbers indicates the class of slope. Symbols without a slope letter are for nearly level soils or miscellaneous areas. A final number of 2 following the slope letter indicates that the soil is eroded and 3 that it is severely eroded.

SYMBOL	NAME
2	[redacted]
3A	Hoyleton silt loam, 0 to 2 percent slopes
3B	Hoyleton silt loam, 2 to 5 percent slopes
3B2	Hoyleton silt loam, 2 to 5 percent slopes, eroded
4B	Richview silt loam, 1 to 5 percent slopes
4C2	Richview silt loam, 5 to 10 percent slopes, eroded
7C3	Atlas silty clay loam, 5 to 10 percent slopes, severely eroded
8F	Hickory silt loam, 15 to 30 percent slopes
12	Wynoose silt loam
13A	Bluford silt loam, 0 to 2 percent slopes
13B	Bluford silt loam, 2 to 5 percent slopes
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded
14B	Ava silt loam, 1 to 5 percent slopes
14C2	Ava silt loam, 5 to 10 percent slopes, eroded
15C2	Parke silt loam, 5 to 12 percent slopes, eroded
16	[redacted]
46	Herrick silt loam
48	Ebbert silt loam
50	[redacted]
70	Beaucoup silty clay loam
77A	Huntsville silt loam, 0 to 3 percent slopes
77B	Huntsville loam, 1 to 5 percent slopes
112	[redacted]
113A	Oconee silt loam, 0 to 2 percent slopes
113B	Oconee silt loam, 2 to 5 percent slopes
113B2	Oconee silt loam, 2 to 5 percent slopes, eroded
120	Huey silt loam
128B	Douglas silt loam, 2 to 7 percent slopes
164A	Stoy silt loam, 0 to 2 percent slopes
164B	Stoy silt loam, 2 to 5 percent slopes
164B2	Stoy silt loam, 2 to 5 percent slopes, eroded
214B	Hosmer silt loam, 2 to 5 percent slopes
214C2	Hosmer silt loam, 5 to 10 percent slopes, eroded
218	Newberry silt loam
242B	Kendall silt loam, 1 to 5 percent slopes
284	Tice silty clay loam
287A	Chauncey silt loam, 0 to 3 percent slopes
331	Haymond silt loam
333	[redacted]
334	Birds silt loam
337A	Creal silt loam, 0 to 3 percent slopes
404	Titus silty clay loam
451	Lawson silt loam
474	[redacted]
517A	Marine silt loam, 0 to 2 percent slopes
517B	Marine silt loam, 2 to 4 percent slopes
570C3	Martinsville silt loam, 5 to 10 percent slopes, severely eroded
581B2	Tamalco silt loam, 1 to 5 percent slopes, eroded
583B	Pike silt loam, 2 to 5 percent slopes
585D	Negley silt loam, 10 to 15 percent slopes
620A	Darmstadt silt loam, 0 to 2 percent slopes
620B3	Darmstadt silty clay loam, 2 to 5 percent slopes, severely eroded
802	Orthents, loamy
865	Pits, gravel
912A	Hoyleton-Darmstadt silt loams, 0 to 2 percent slopes
912B2	Hoyleton-Darmstadt silt loams, 2 to 5 percent slopes, eroded
914C3	Atlas-Grantfork silty clay loams, 4 to 10 percent slopes, severely eroded
916A	Oconee-Darmstadt silt loams, 0 to 3 percent slopes
916B2	Oconee-Darmstadt silt loams, 2 to 5 percent slopes, eroded
941	Virden-Piasa silt loams
946D3	Hickory-Atlas complex, 10 to 15 percent slopes, severely eroded
967F	Hickory-Gosport complex, 15 to 30 percent slopes
991	Cisne-Huey silt loams
993	[redacted]
995	Herrick-Piasa silt loams

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEMS & DESIGNATIONS

- Interstate
- Federal
- State
- County, farm or ranch

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label)
- Located object (label)
- Tank (label)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial
- Intermittent

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

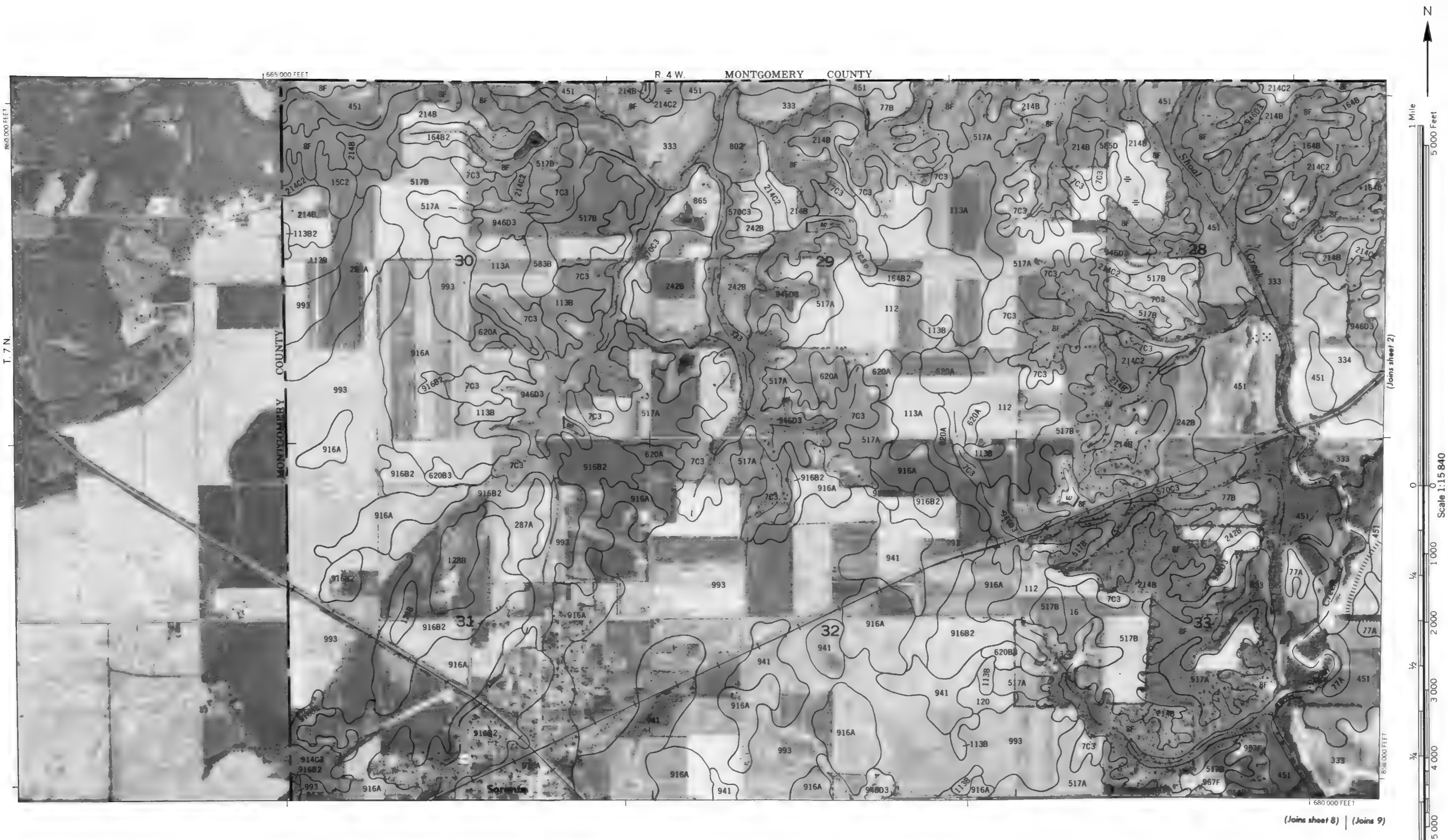
DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown)

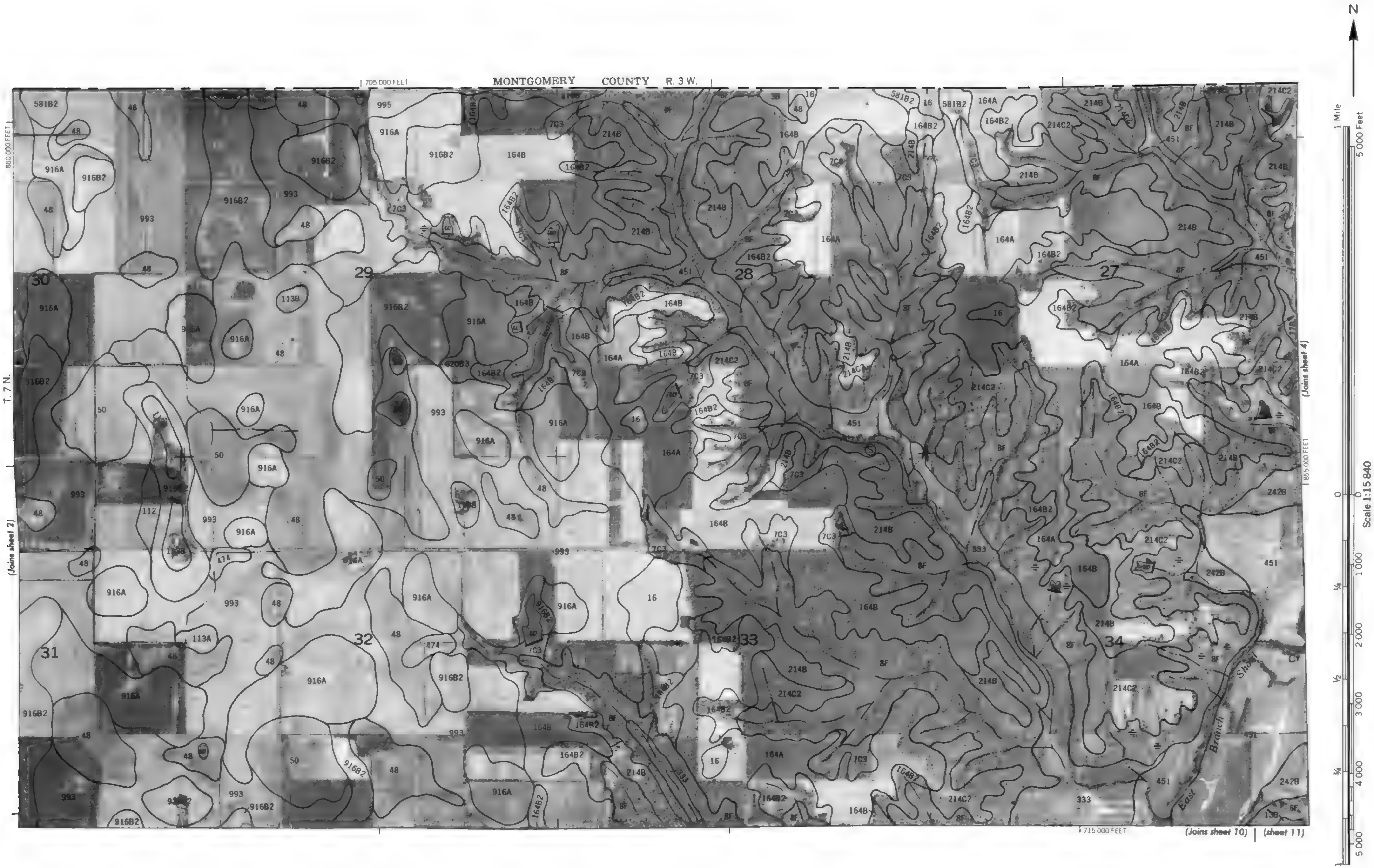
MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot
- Calcareous spot

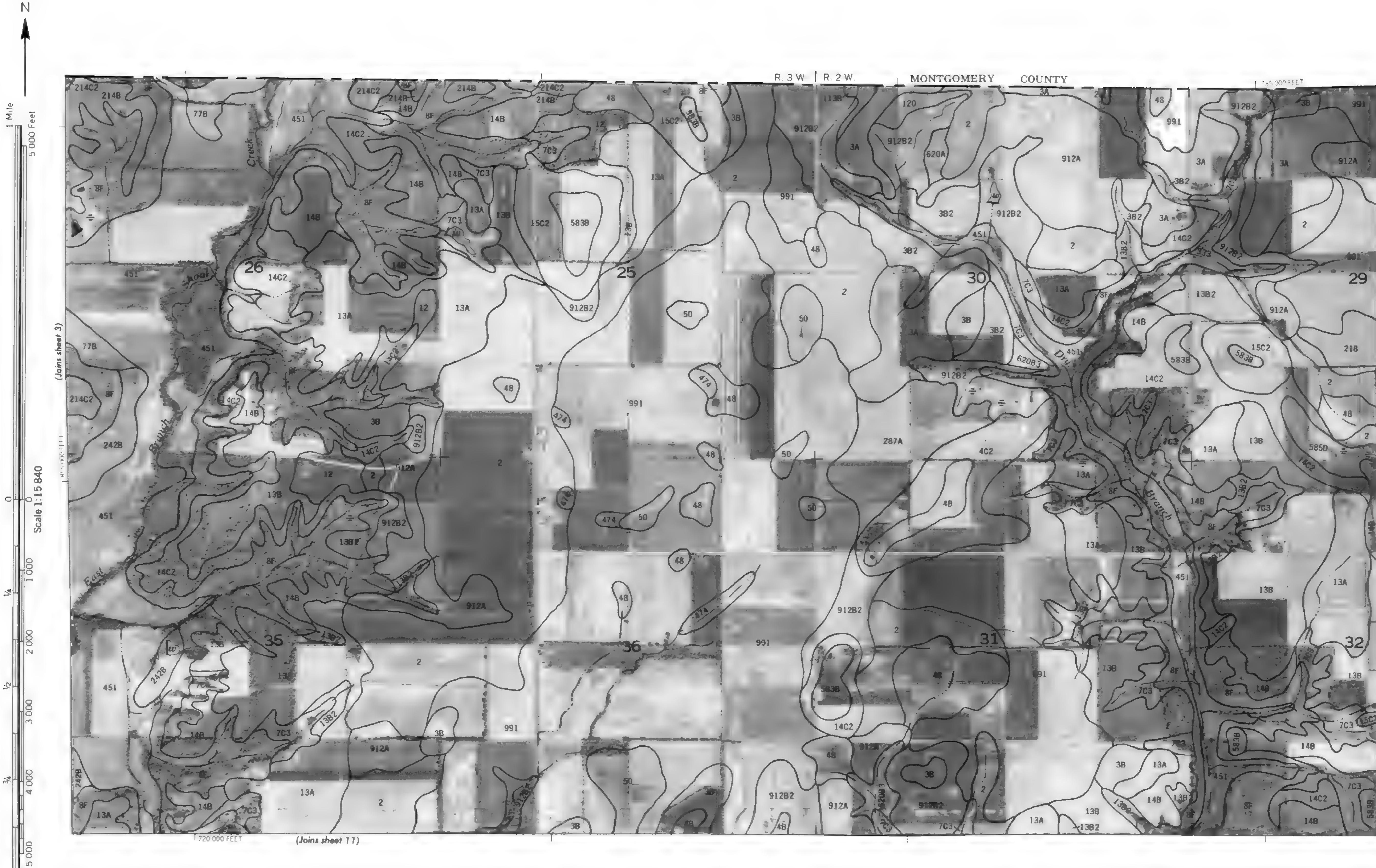
1

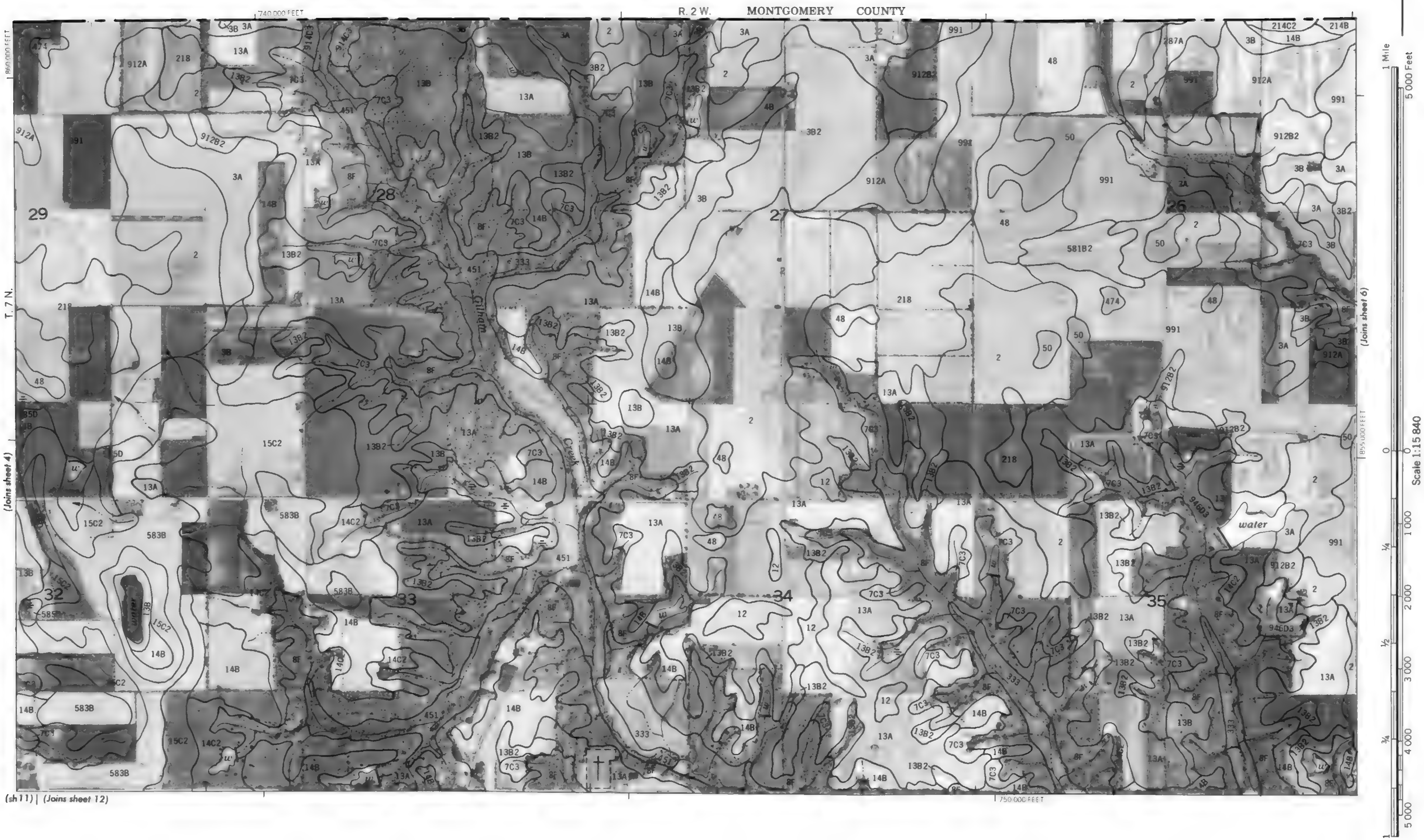

N
R. 4 W.
MONTGOMERY COUNTY
MONTGOMERY COUNTY
T. 7 N.
665 000 FEET
860 000 FEET
680 000 FEET
30
29
28
31
32
33
Shoal Creek
Sorento
(Joins sheet 2)
(Joins sheet 8)
(Joins 9)
1 Mile
5 000 Feet
Scale 1:15 840


2
N
MONTGOMERY COUNTY
R. 4 W.
R. 3 W.
T. 7 N.
(Joins sheet 1)
(Joins sheet 3)
(Joins sheet 9)
(sheet 10)
Panama
Donnellson
27
26
25
30
34
35
36
31
1 Mile
5 000 Feet
Scale 1:15 840
0
1 000
¼
2 000
½
3 000
¾
4 000
5 000
1

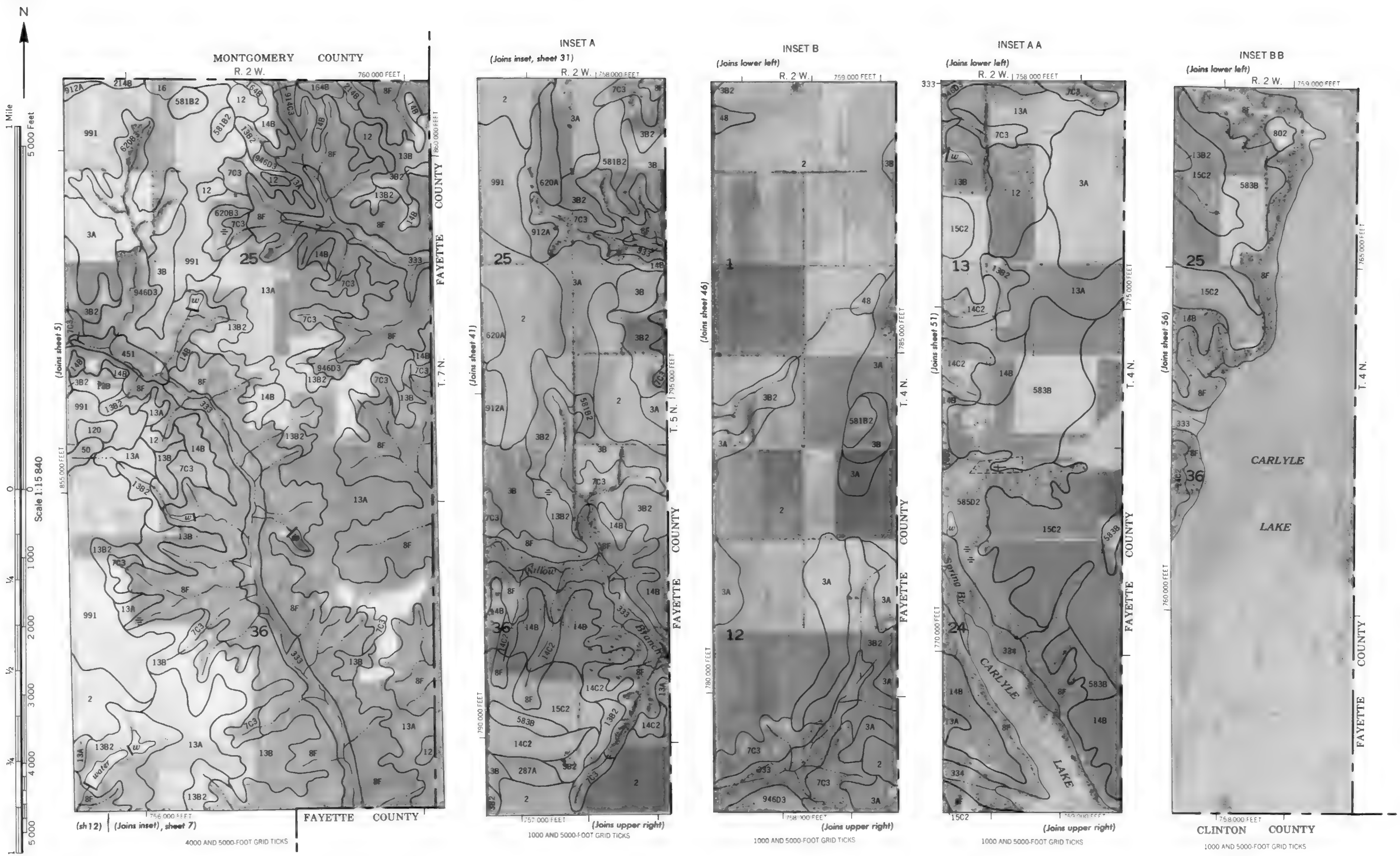


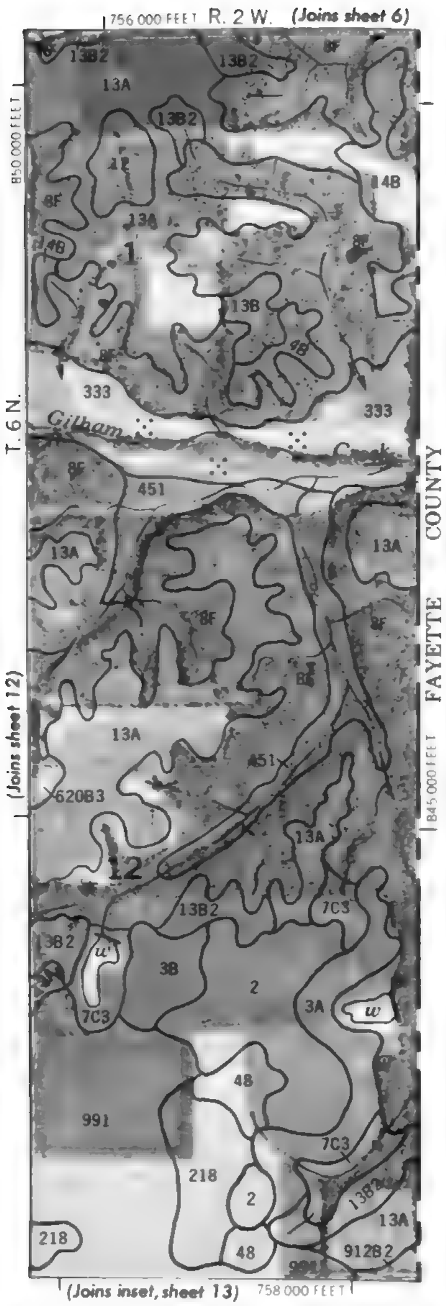
N
MONTGOMERY COUNTY
R. 3 W.
705 000 FEET
715 000 FEET
860 000 FEET
855 000 FEET
T. 7 N.
(Joins sheet 2)
(Joins sheet 4)
(Joins sheet 10)
(sheet 11)
East Branch Shoal Cr
1 Mile
5 000 Feet
Scale 1:15 840


N
MONTGOMERY COUNTY
R. 3 W.
R. 2 W.
T. 7 N.
(Joins sheet 3)
(Joins sheet 5)
(Joins sheet 11)
720 000 FEET
Scale 1:15 840
1 Mile
5 000 Feet
East Shoal Creek Branch
Dry Branch
25
26
29
30
31
32
35
36

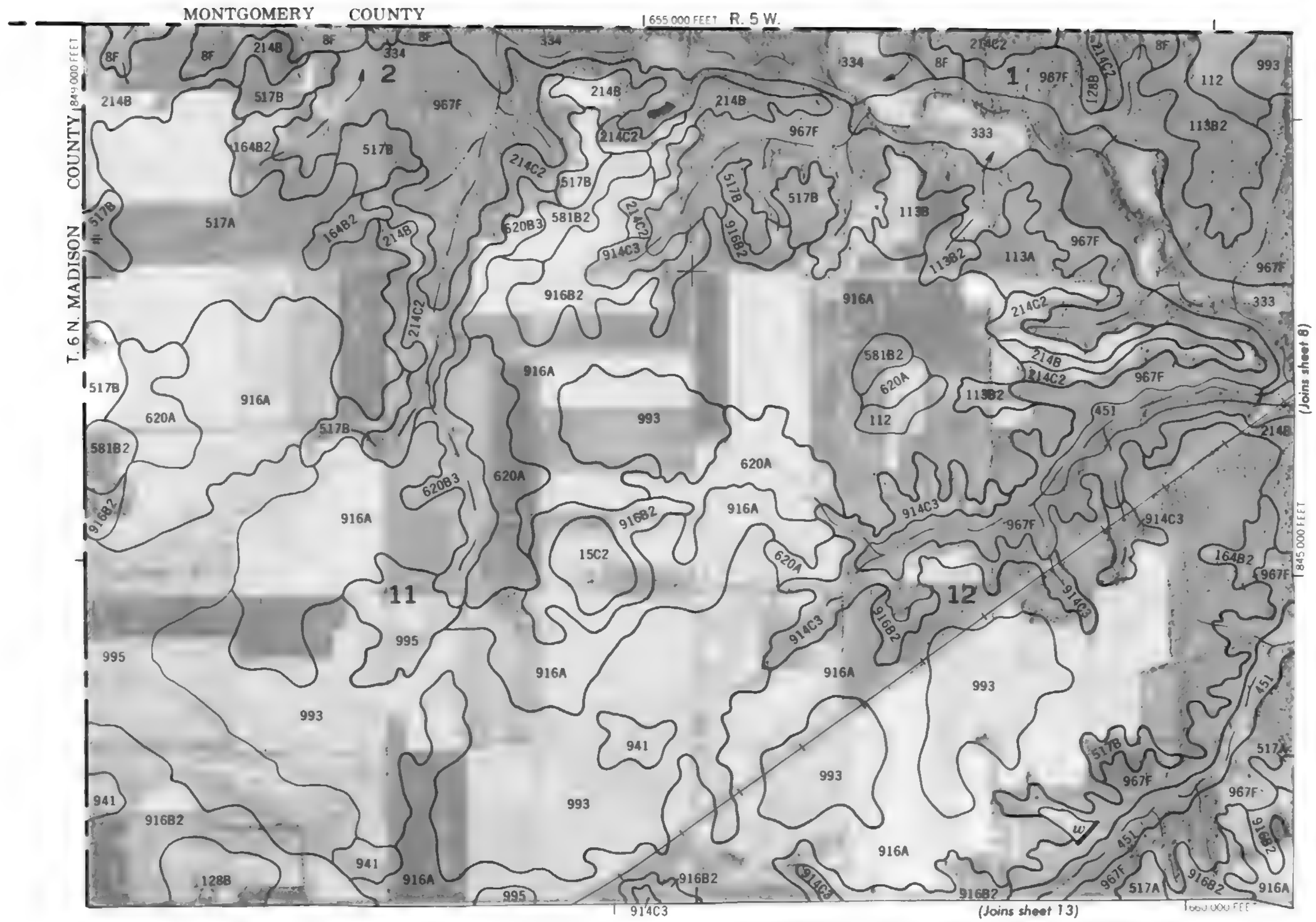


5
N
R. 2 W.
MONTGOMERY COUNTY
740 000 FEET
750 000 FEET
855 000 FEET
860 000 FEET
T. 7 N.
(Joins sheet 4)
(Joins sheet 6)
(sh11) | (Joins sheet 12)
Gilham Creek
water
26
27
28
29
32
33
34
35
1 Mile
5 000 Feet
Scale 1:15 840


N
MONTGOMERY COUNTY
R. 2 W.
FAYETTE COUNTY
T. 7 N.
(Joins sheet 5)
(sh12) (Joins inset), sheet 7)
4000 AND 5000-FOOT GRID TICKS
INSET A
(Joins inset, sheet 31)
R. 2 W.
(Joins sheet 41)
T. 5 N.
FAYETTE COUNTY
(Joins upper right)
1000 AND 5000-FOOT GRID TICKS
INSET B
(Joins lower left)
R. 2 W.
(Joins sheet 46)
T. 4 N.
FAYETTE COUNTY
(Joins upper right)
1000 AND 5000-FOOT GRID TICKS
INSET A A
(Joins lower left)
R. 2 W.
(Joins sheet 51)
T. 4 N.
FAYETTE COUNTY
CARLYLE LAKE
(Joins upper right)
1000 AND 5000-FOOT GRID TICKS
INSET B B
(Joins lower left)
R. 2 W.
(Joins sheet 56)
T. 4 N.
CARLYLE LAKE
FAYETTE COUNTY
CLINTON COUNTY
1000 AND 5000-FOOT GRID TICKS
1 Mile
5 000 Feet
Scale 1:15 840

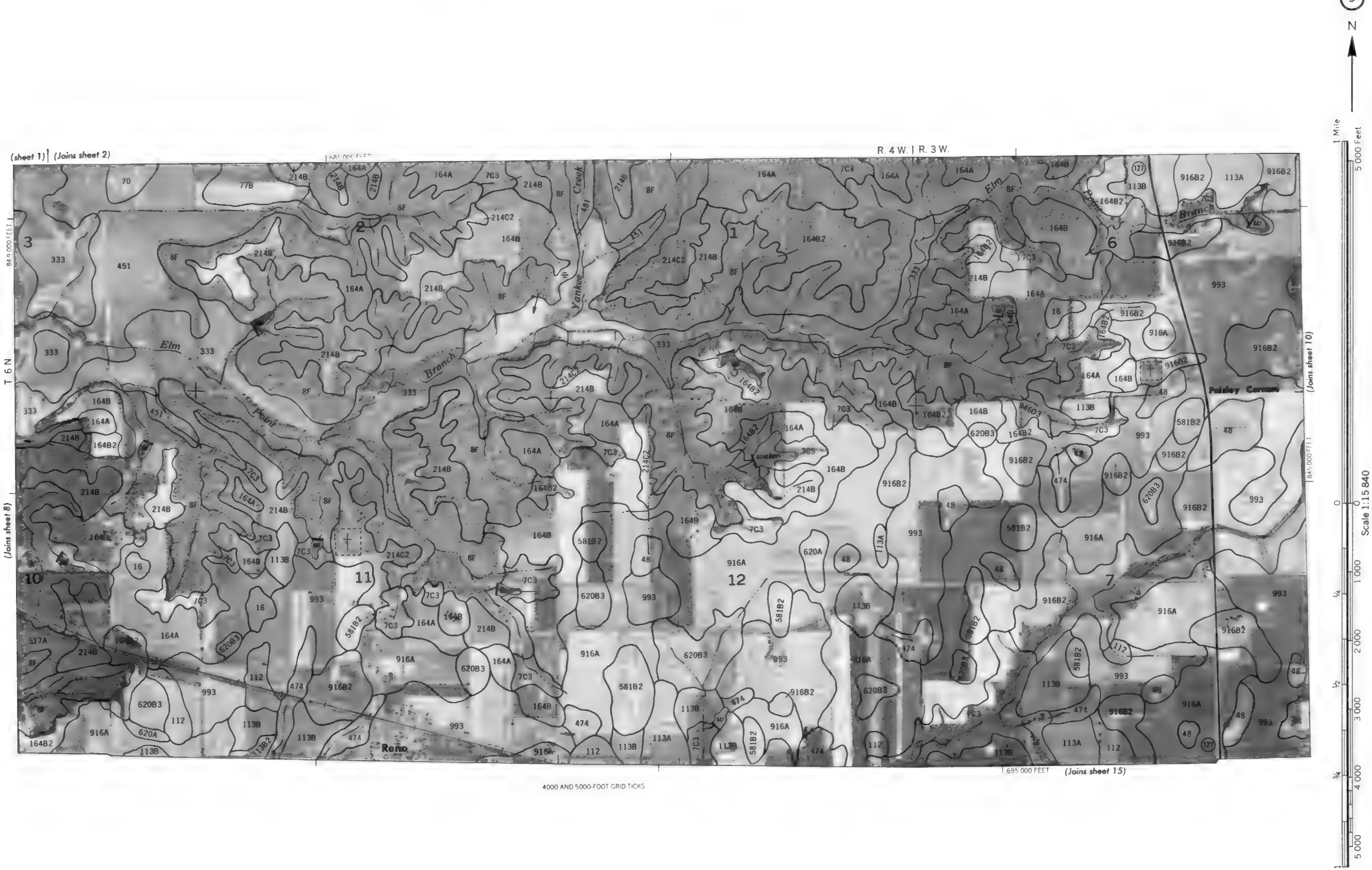


2000 AND 5000-FOOT GRID TICKS



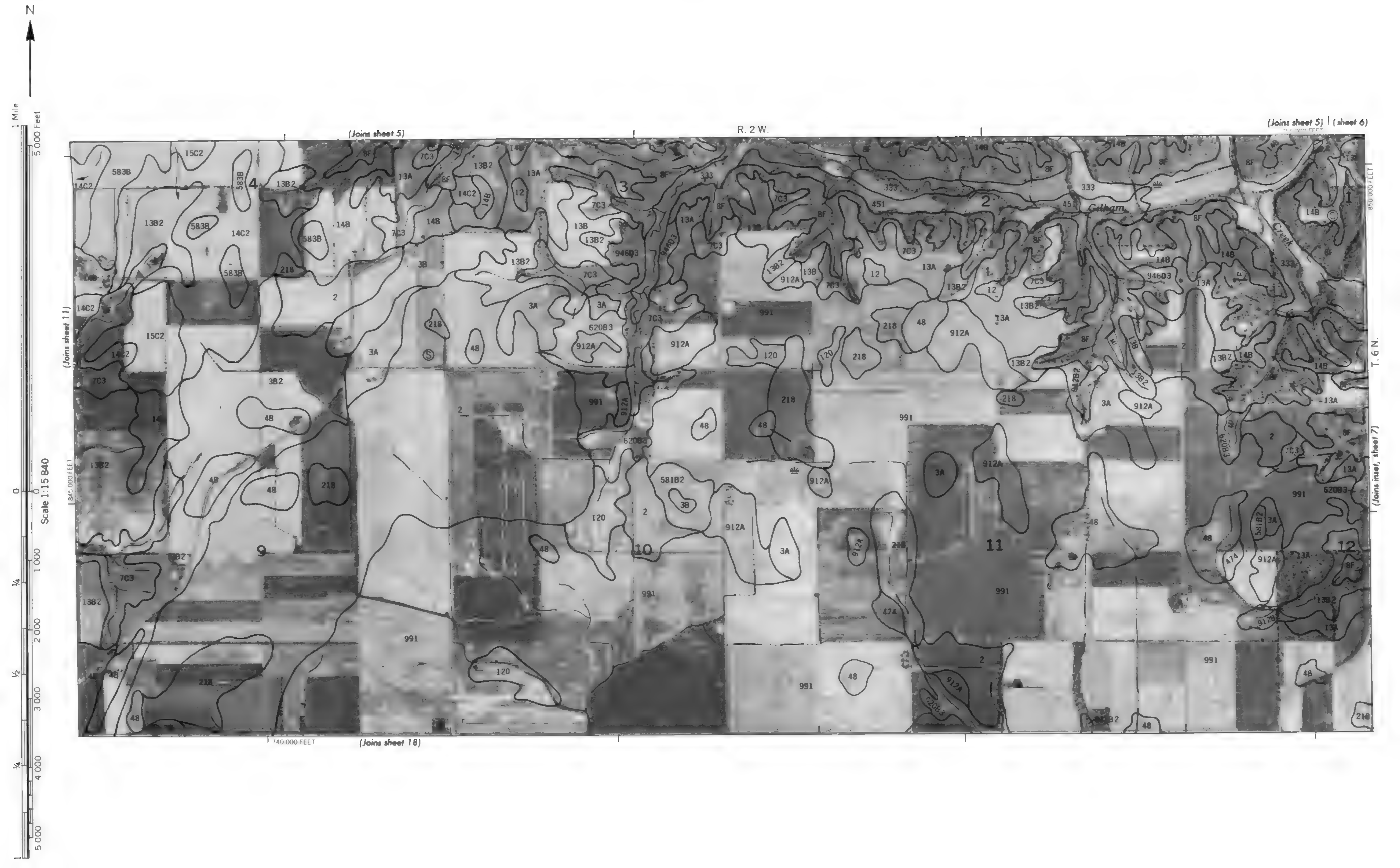
4000 AND 5000-FOOT GRID TICKS

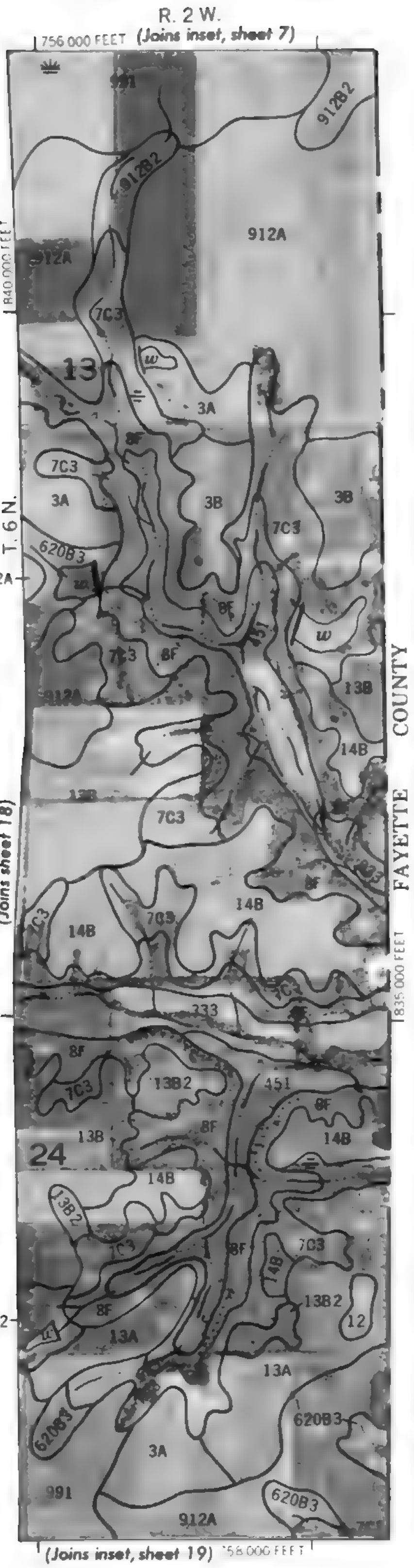

8
N
1 Mile
5 000 Feet
Scale 1:15 840
MONTGOMERY COUNTY
(Joins sheet 1)
R. 4 W.
(Joins sheet 7)
(Joins sheet 9)
(Joins sheet 14)
T. 6 N.
Sorento
CEMETERY
Shoal Creek
4000 AND 5000-FOOT GRID TICKS
5
4
3
7
8
9
10
993
995
916A
916B2
517A
517B
7C3
967F
214B
333
164B2
941
50
451
337A
242B
570C3
77B
70
914C3
214C2
8F


(sheet 1)
(Joins sheet 2)
R. 4 W. | R. 3 W.
T 6 N
(Joins sheet 8)
(Joins sheet 10)
(Joins sheet 15)
695 000 FEET
4000 AND 5000-FOOT GRID TICKS
Elm Branch
Yankee Creek
Paisley Corners
Reno
N
1 Mile
5 000 Feet
Scale 1:15 840

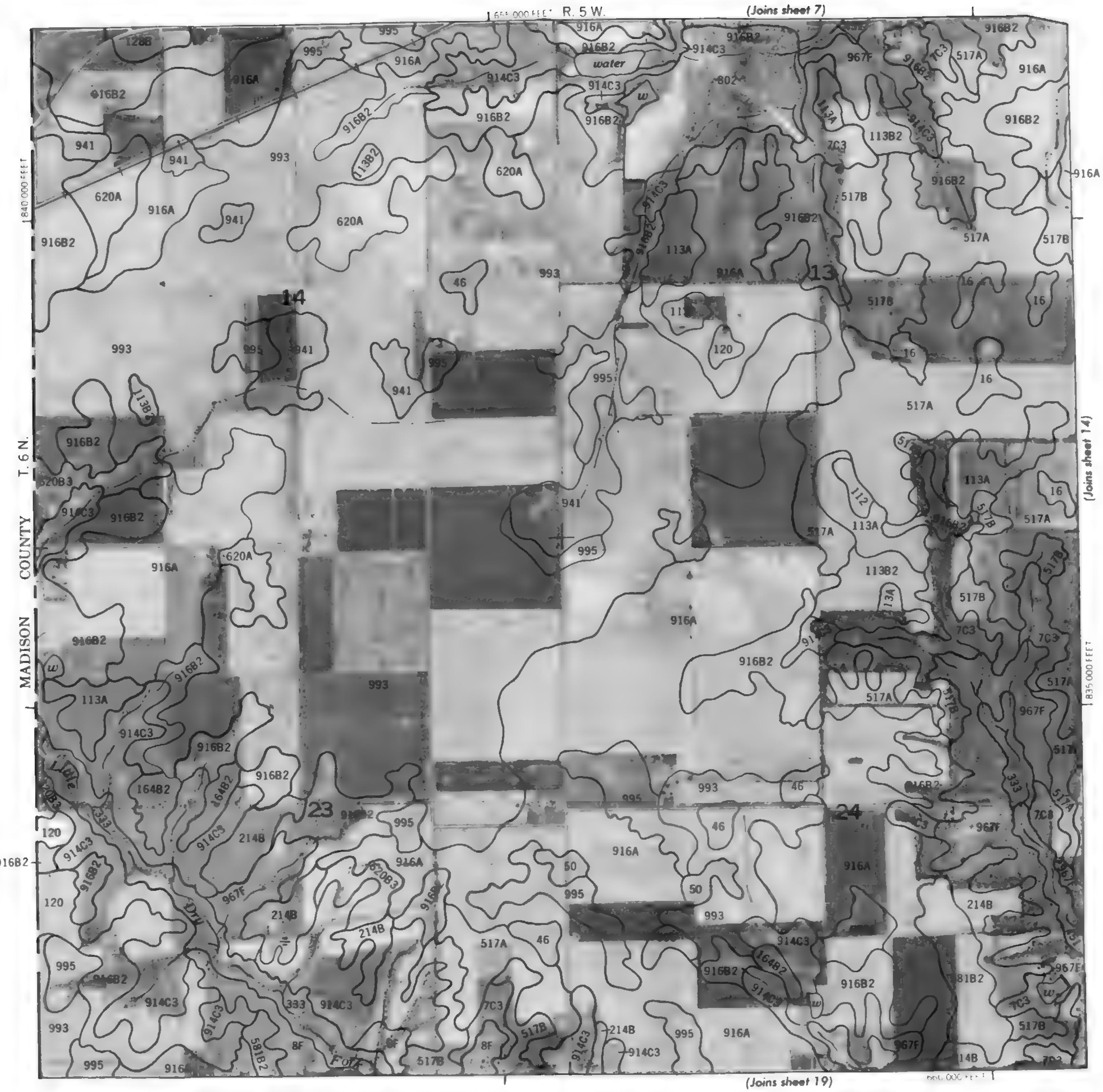

N
1 Mile
5 000 Feet
Scale 1:15 840
(sheet 2)
(Joins sheet 3)
R. 3 W.
715 000 FEET
850 000 FEET
T. 6 N.
(Joins sheet 9)
(Joins sheet 11)
845 000 FEET
700 000 FEET
(Joins sheet 16)
Shoal Creek
East Branch

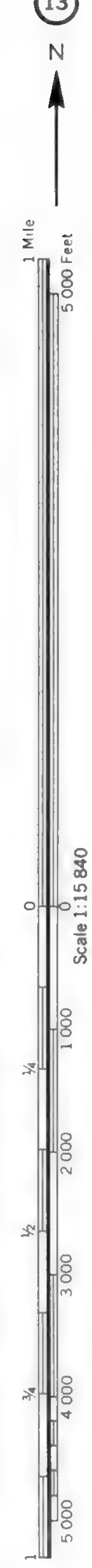

N
(Joins sh 3)
(Joins sheet 4)
720 000 FEET
R. 3 W.
R. 2 W.
(Joins sheet 4)
(5)
T. 6 N.
(Joins sheet 10)
(Joins sheet 12)
(Joins sheet 17)
735 000 FEET
850 000 FEET
845 000 FEET
water
Branch
Dry
1 Mile
5 000 Feet
Scale 1:15 840
0
1000
2000
3000
4000
5 000
1/4
1/2
3/4
1
1
2
5
6
7
8
11
12


12
N
1 Mile
5 000 Feet
0
1 000
2 000
3 000
4 000
5 000
¼
½
¾
Scale 1:15 840
(Joins sheet 5)
R. 2 W.
(Joins sheet 5) | (sheet 6)
(Joins sheet 11)
T. 6 N.
(Joins inset, sheet 7)
(Joins sheet 18)
740 000 FEET
845 000 FEET
850 000 FEET
Gilham
Creek

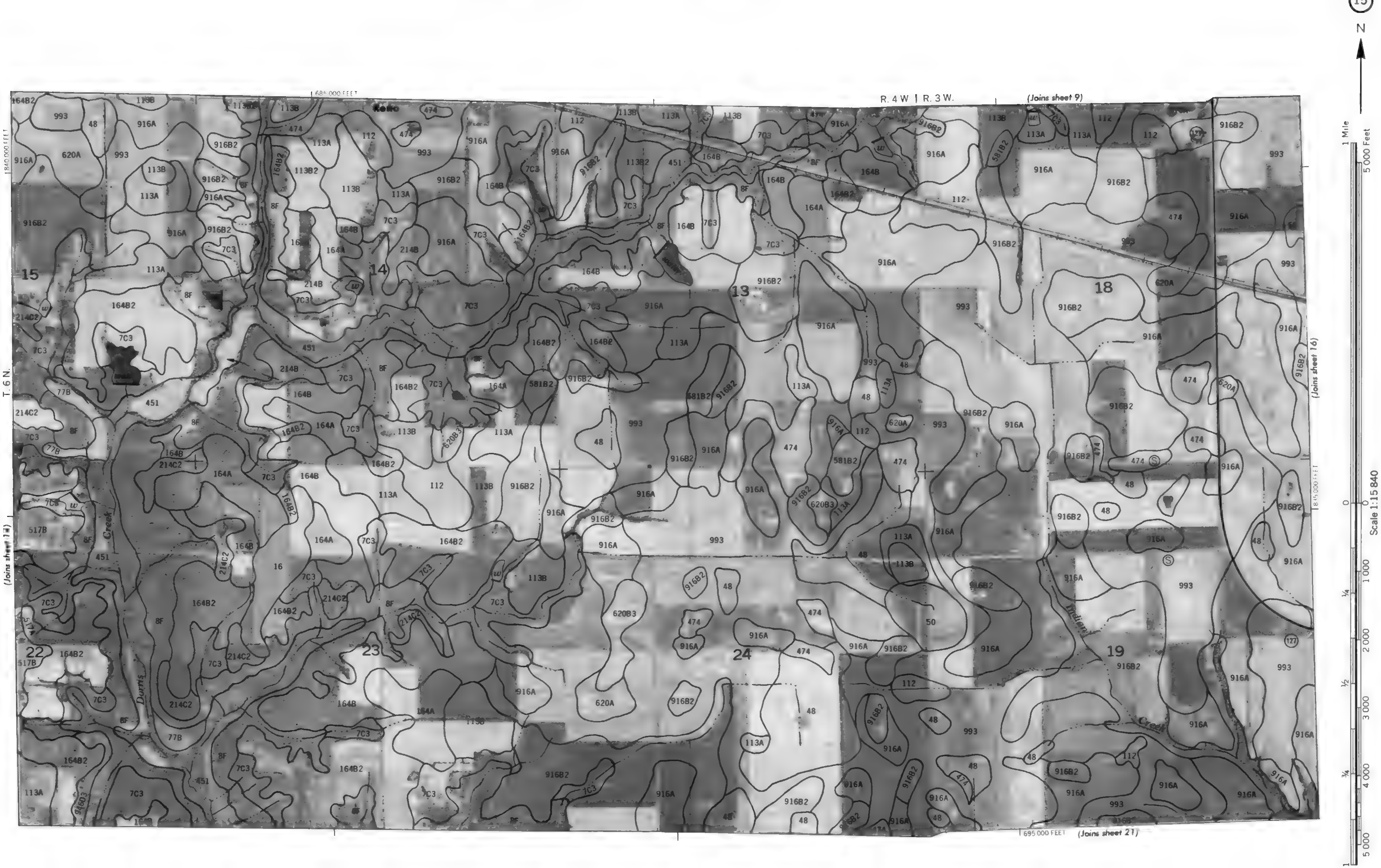


2000 AND 5000 FOOT GRID TICKS



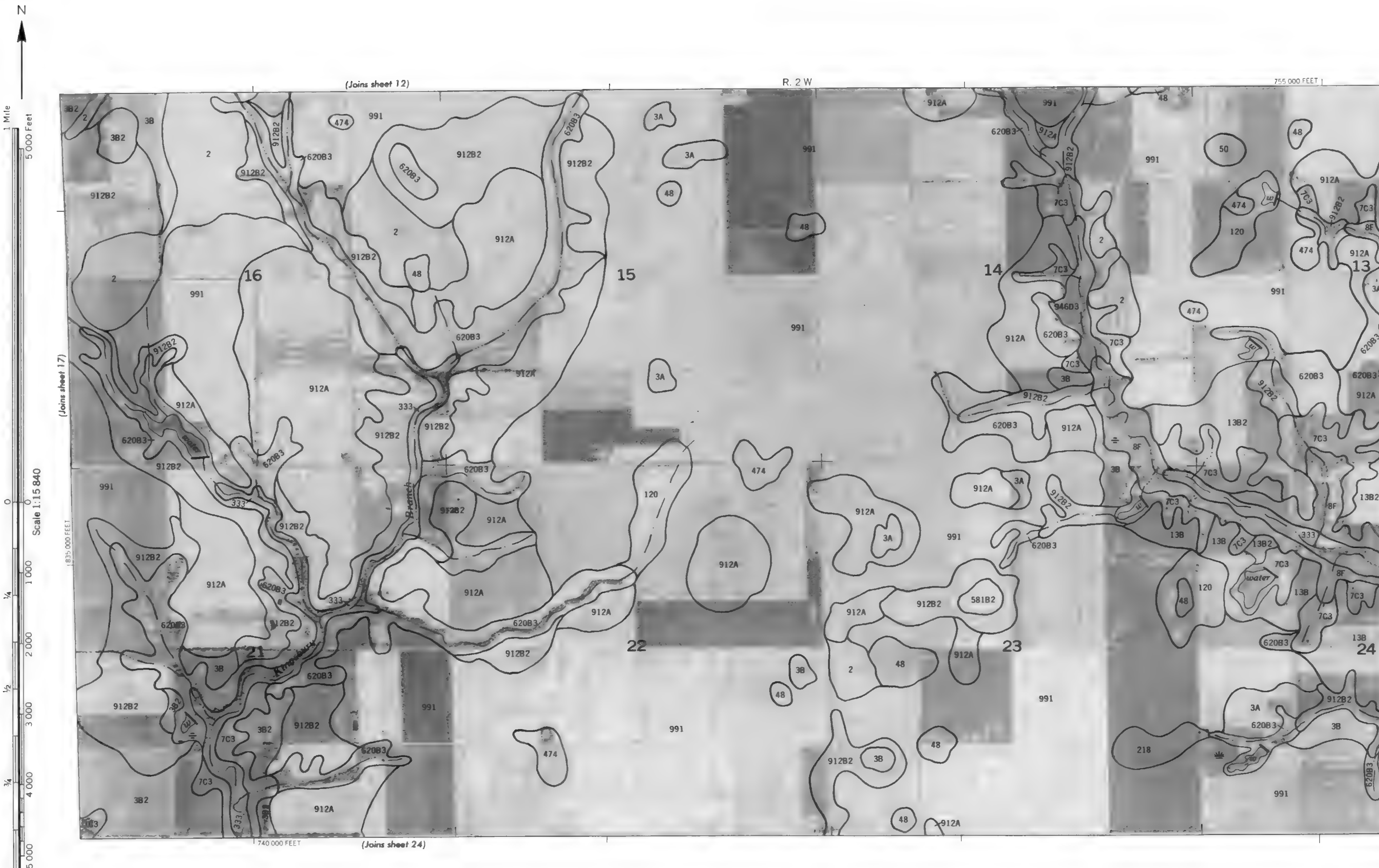


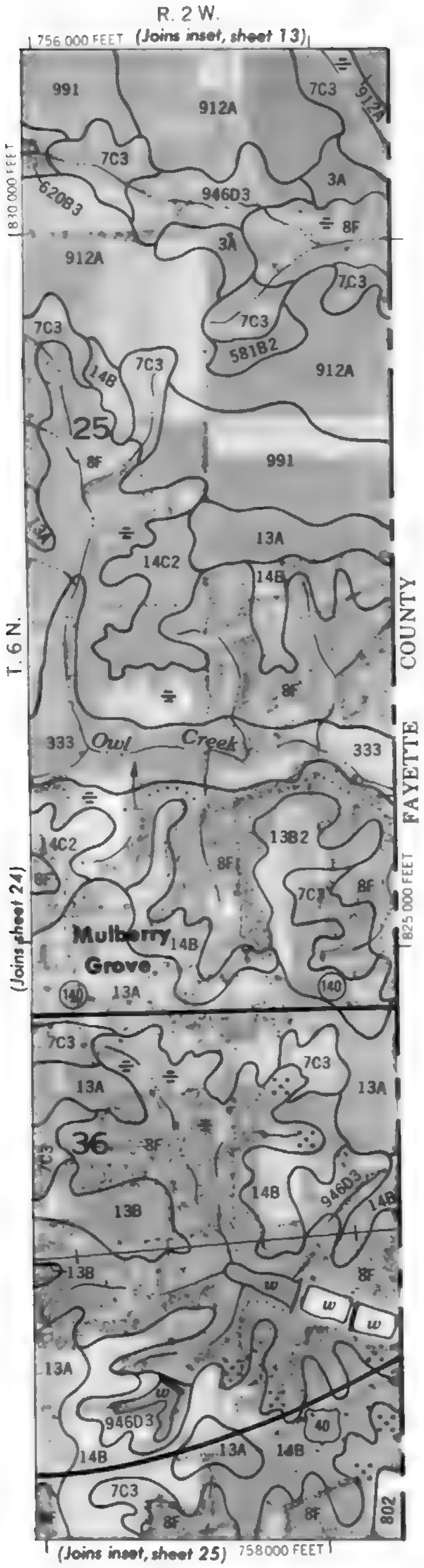

N
1 Mile
5 000 Feet
0
Scale 1:15 840
1000
2000
3000
4000
5 000
¼
½
¾
1
(Joins sheet 8)
R 4 W.
680 000 FEET
(Joins sheet 13)
T. 6 N.
(Joins sheet 15)
(Joins sheet 20)
665 000 FEET
15
16
17
18
19
20
21
22
Shoal Creek
Dry Fork


15
N
(Joins sheet 9)
R. 4 W. | R. 3 W.
685 000 FEET
840 000 FEET
845 000 FEET
695 000 FEET
T. 6 N.
(Joins sheet 14)
(Joins sheet 16)
(Joins sheet 21)
Creek
Dorris
Indian
Creek
Keno
15
14
13
18
22
23
24
19
1 Mile
5 000 Feet
0
1/4
1/2
3/4
1 000
2 000
3 000
4 000
5 000
Scale 1:15 840

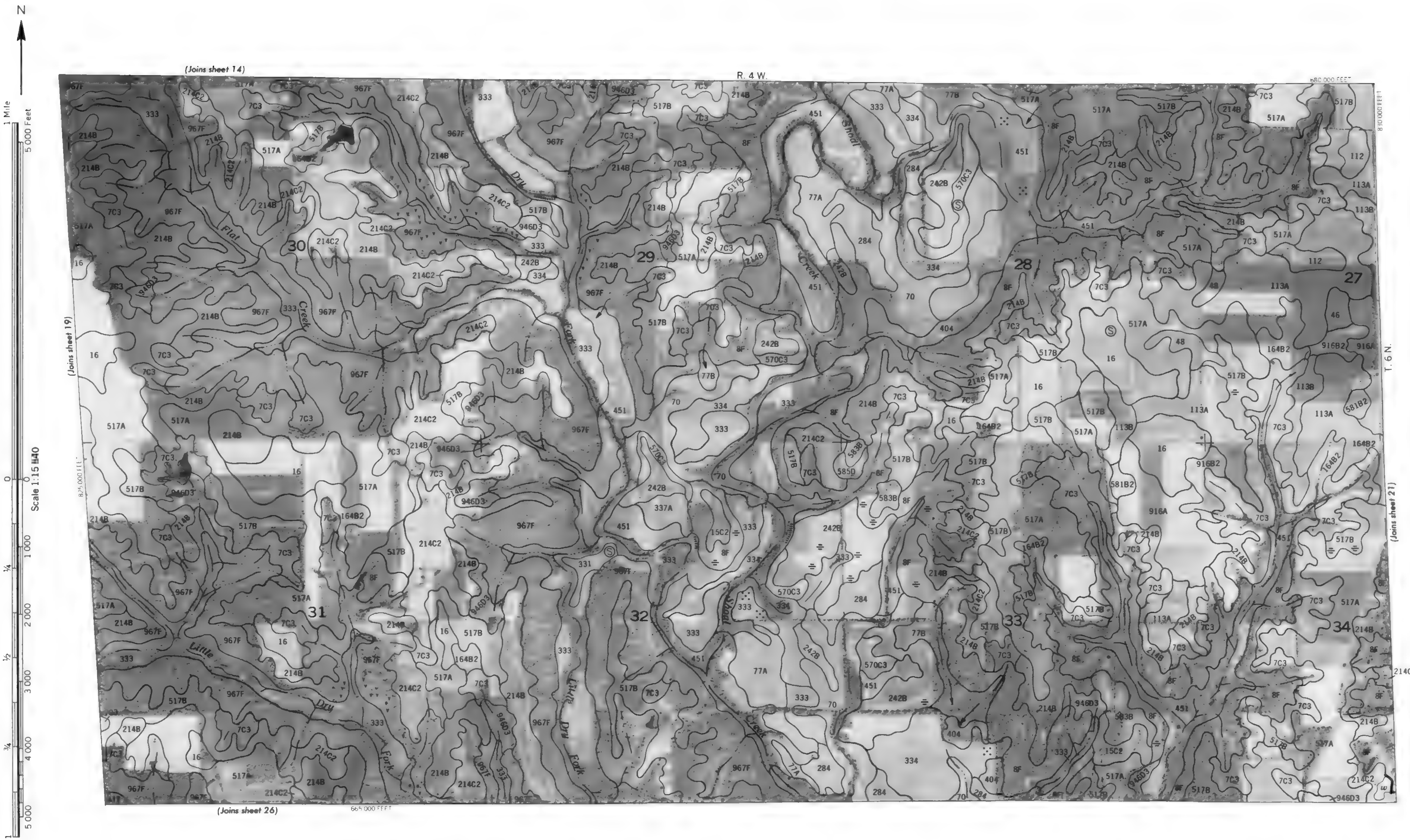

16
N
(Joins sheet 10)
R 3 W.
(Joins sheet 15)
(Joins sheet 17)
(Joins sheet 22)
T. 6 N.
Scale 1:15 840
1 Mile
5 000 Feet
Ayers
Shoal Creek
East Branch
water

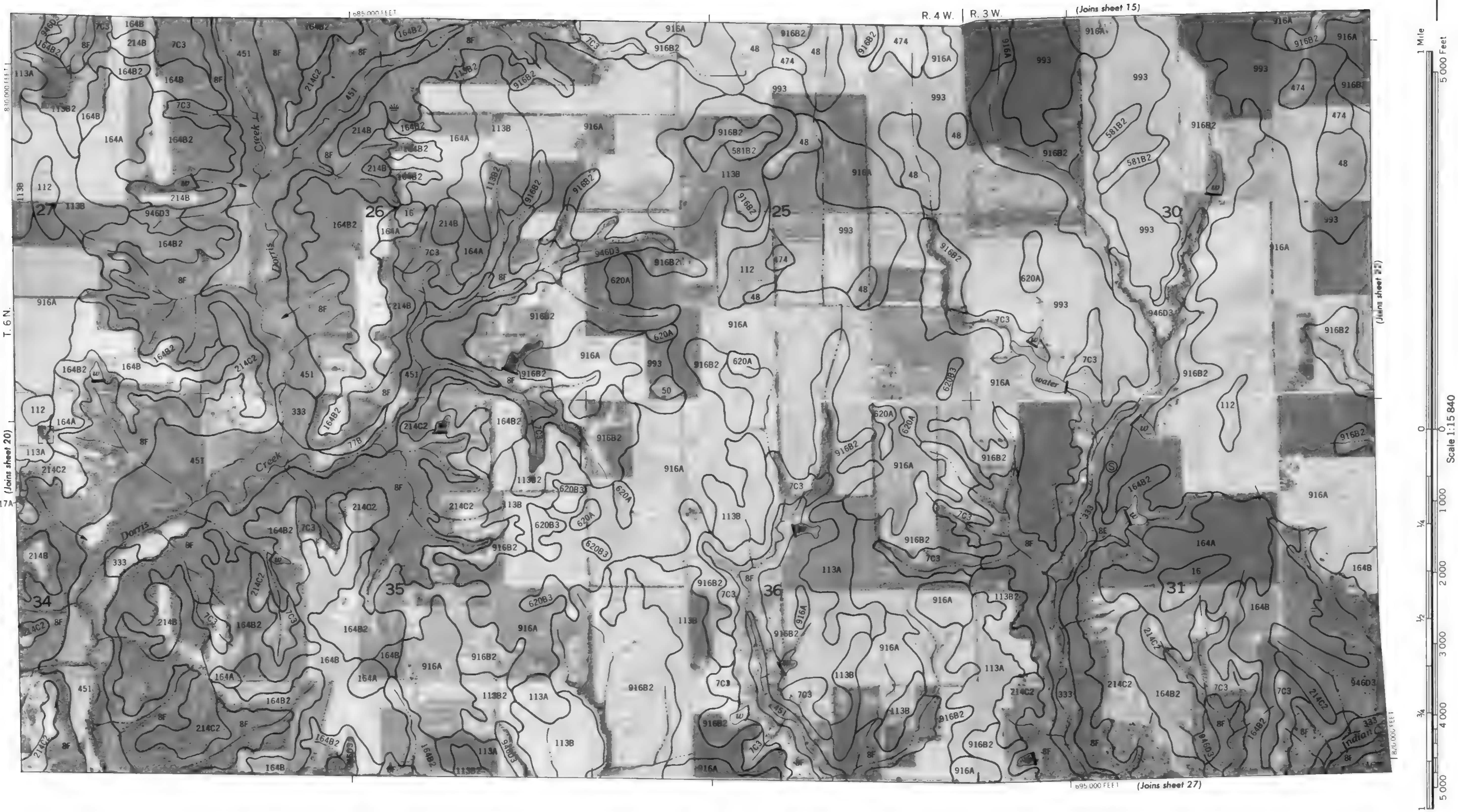

N
R. 3 W.
R. 2 W.
720 000 FEET
840 000 FEET
(Joins sheet 11)
(Joins sheet 16)
(Joins sheet 18)
(Joins sheet 23)
735 000 FEET
T. 6 N.
GOVERNOR
BOND
LAKE
Dry Branch
Woburn
water
1 Mile
5 000 Feet
Scale 1:15 840
0
1000
2000
3000
4000
5 000
¼
½
¾

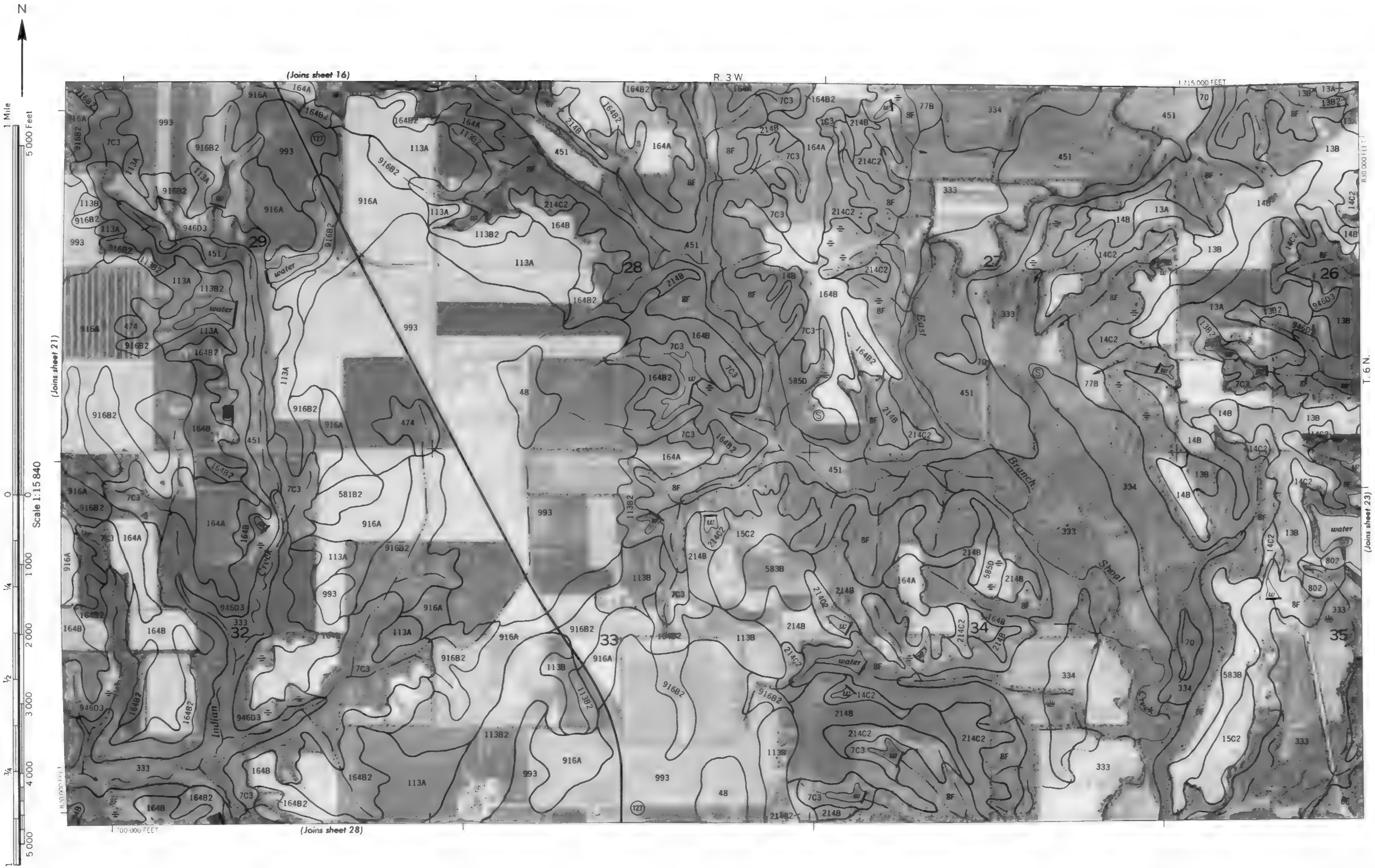

N
(Joins sheet 12)
R. 2 W
755 000 FEET
(Joins sheet 17)
T. 6 N.
(Joins inset, sheet 13)
1 840 000 FEET
1 835 000 FEET
740 000 FEET
(Joins sheet 24)
16
15
14
13
21
22
23
24
Branch
water
1 Mile
5 000 Feet
Scale 1:15 840
0
1 000
2 000
3 000
4 000
5 000
¼
½
¾

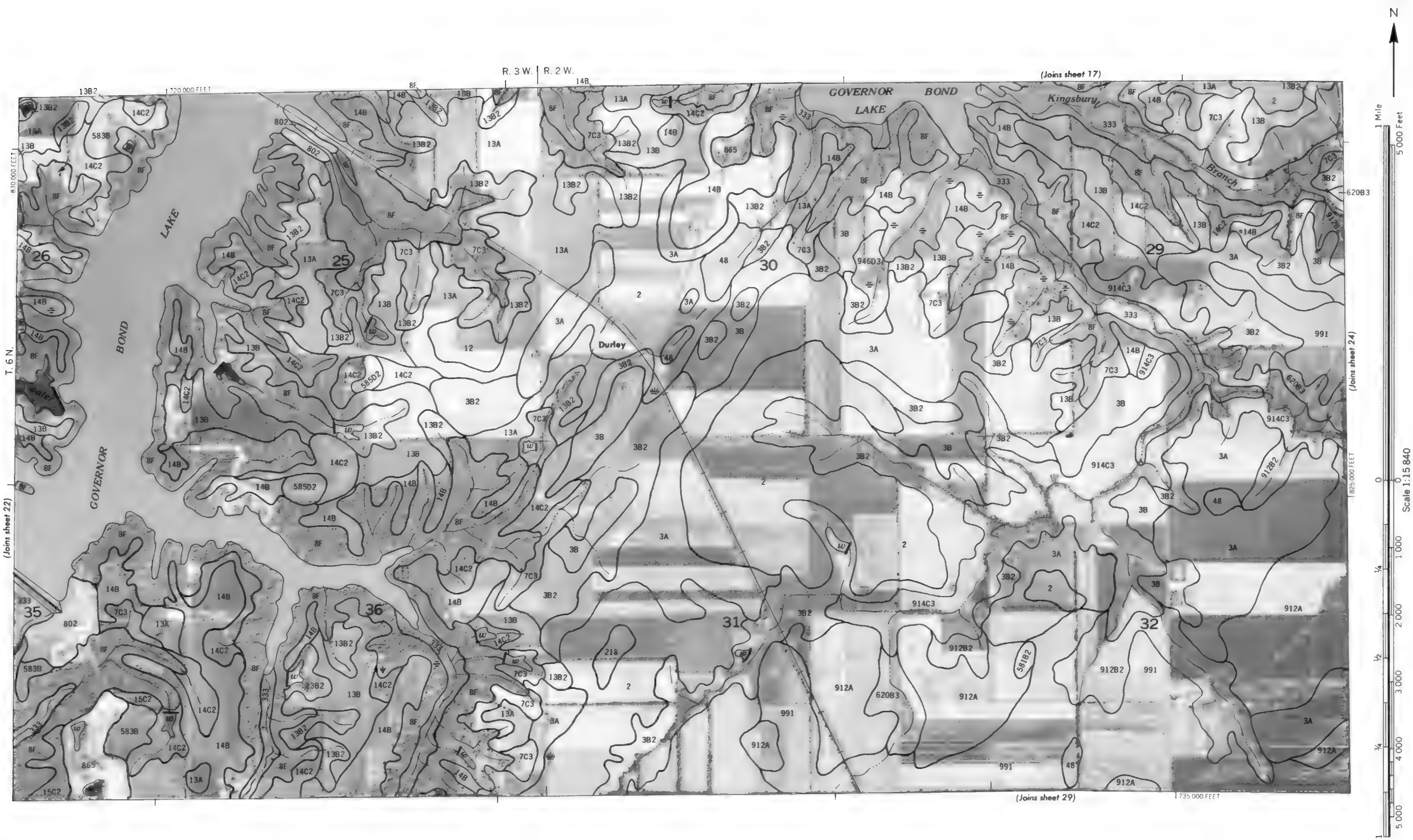


2000 AND 5000-FOOT GRID TICKS

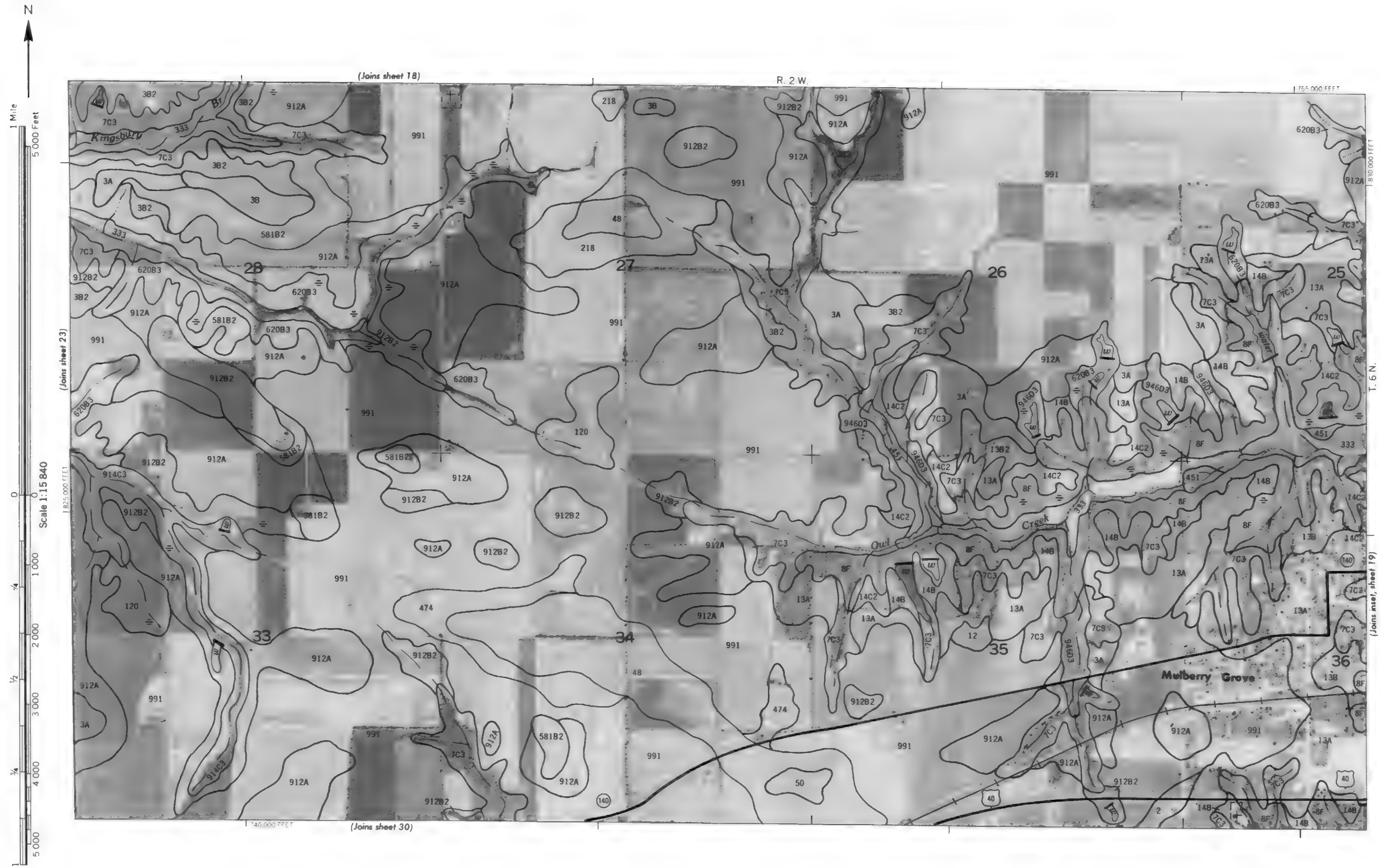

20
N
1 Mile
5 000 Feet
Scale 1:15 840
(Joins sheet 14)
(Joins sheet 19)
(Joins sheet 21)
(Joins sheet 26)
R. 4 W.
T. 6 N.
680 000 FEET
810 000 FEET
825 000 FEET
665 000 FEET
Flat Creek
Dry Fork
Shoal Creek
Little Dry Fork
Little Dry Fork
27
28
29
30
31
32
33
34

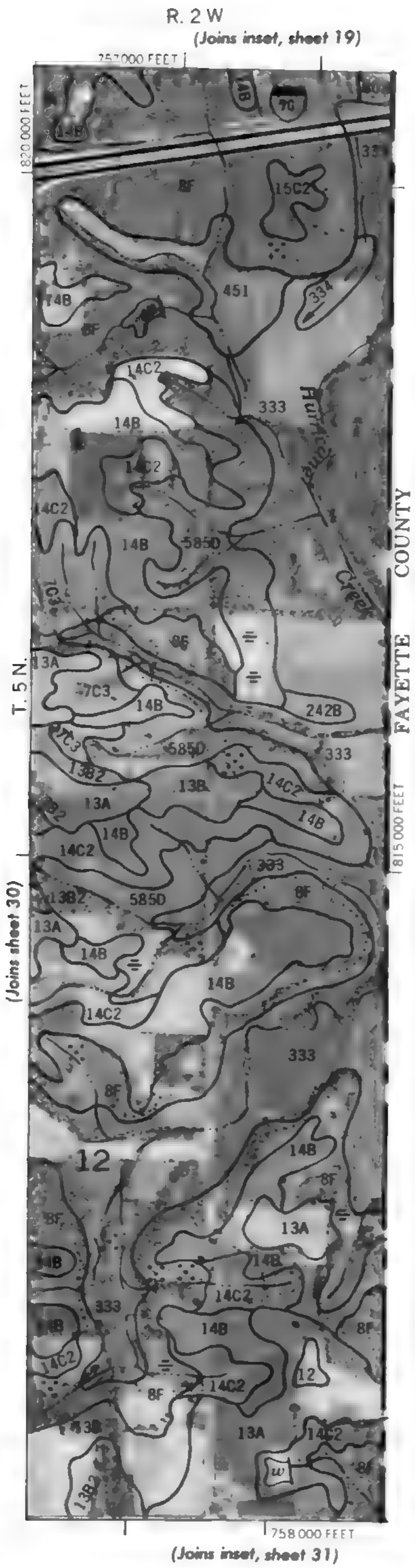

N
(Joins sheet 15)
(Joins sheet 20)
(Joins sheet 22)
(Joins sheet 27)
R. 4 W.
R. 3 W.
T. 6 N.
Scale 1:15 840
1 Mile
5 000 Feet
Creek
Dorris
25
26
27
30
31
34
35
36

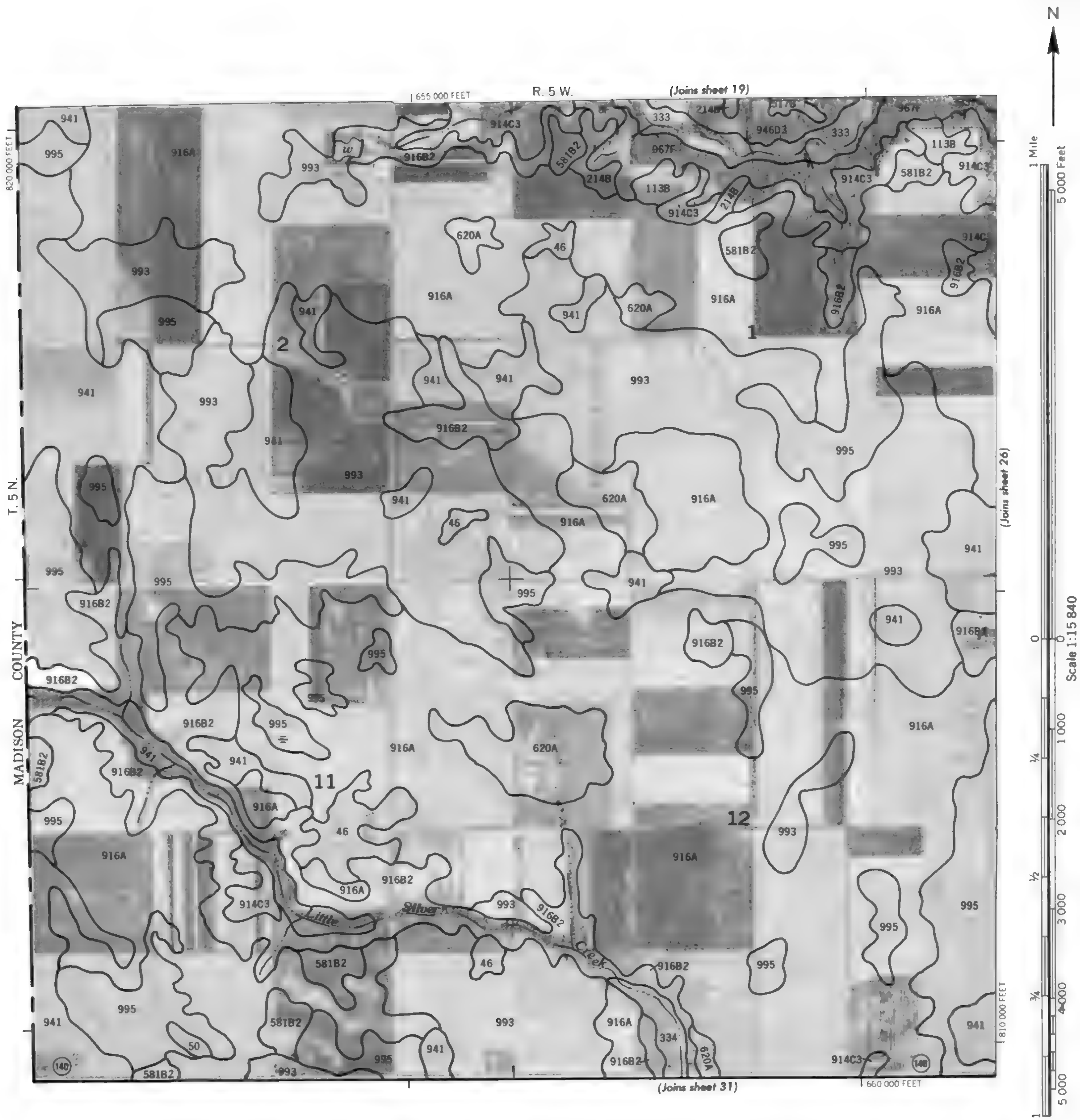

N
(Joins sheet 16)
R. 3 W
T. 6 N.
(Joins sheet 21)
(Joins sheet 23)
(Joins sheet 28)
1 Mile
5 000 Feet
Scale 1:15 840
1 000
2 000
3 000
4 000
5 000
0
¼
½
¾
1
1 715 000 FEET
29
28
27
26
32
33
34
35
Indian Creek
East Branch Shoal Creek
water
127


23
N
R. 3 W. | R. 2 W.
T. 6 N.
(Joins sheet 17)
(Joins sheet 22)
(Joins sheet 24)
(Joins sheet 29)
GOVERNOR BOND LAKE
GOVERNOR
BOND
LAKE
Kingsbury
Branch
Durley
water
720 000 FEET
830 000 FEET
825 000 FEET
735 000 FEET
26
25
30
29
35
36
31
32
1 Mile
5 000 Feet
Scale 1:15 840
0
1 000
2 000
3 000
4 000
5 000
¼
½
¾
1

BOND COUNTY, ILLINOIS — SHEET NUMBER 24

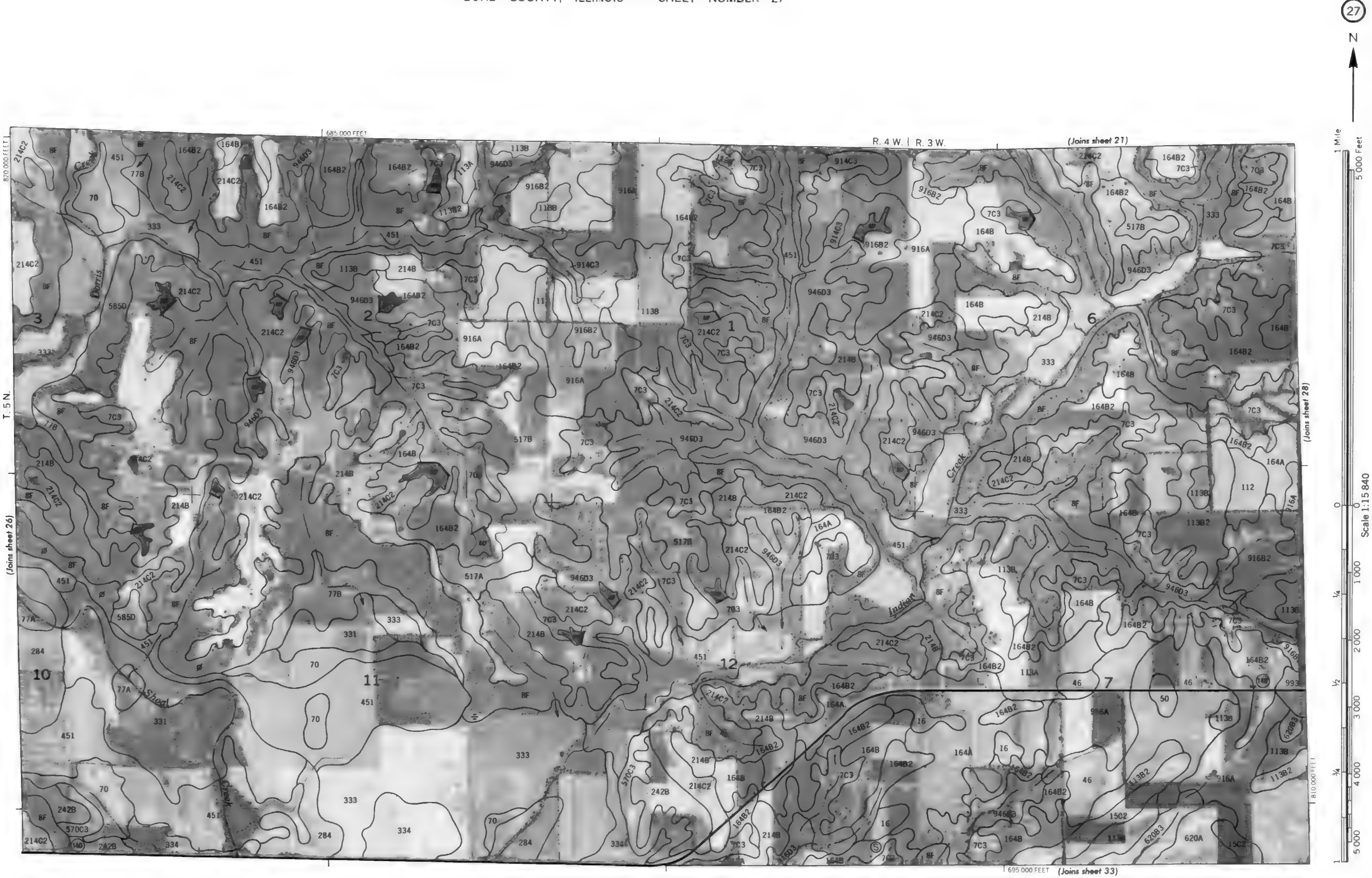


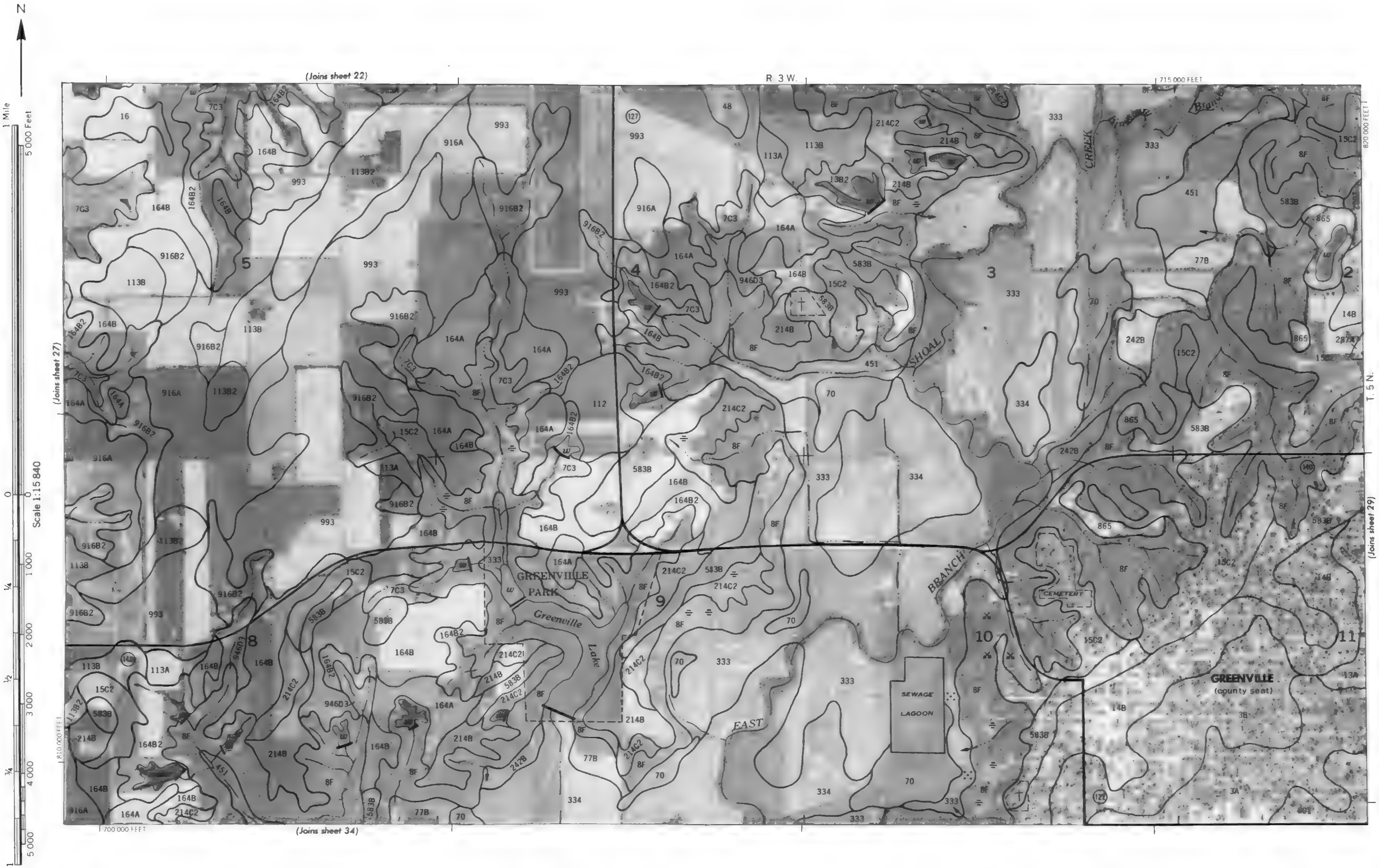

R. 2 W
(Joins inset, sheet 19)
757 000 FEET
820 000 FEET
815 000 FEET
758 000 FEET
(Joins inset, sheet 31)
(Joins sheet 30)
T. 5 N.
FAYETTE COUNTY
Hurricane Creek

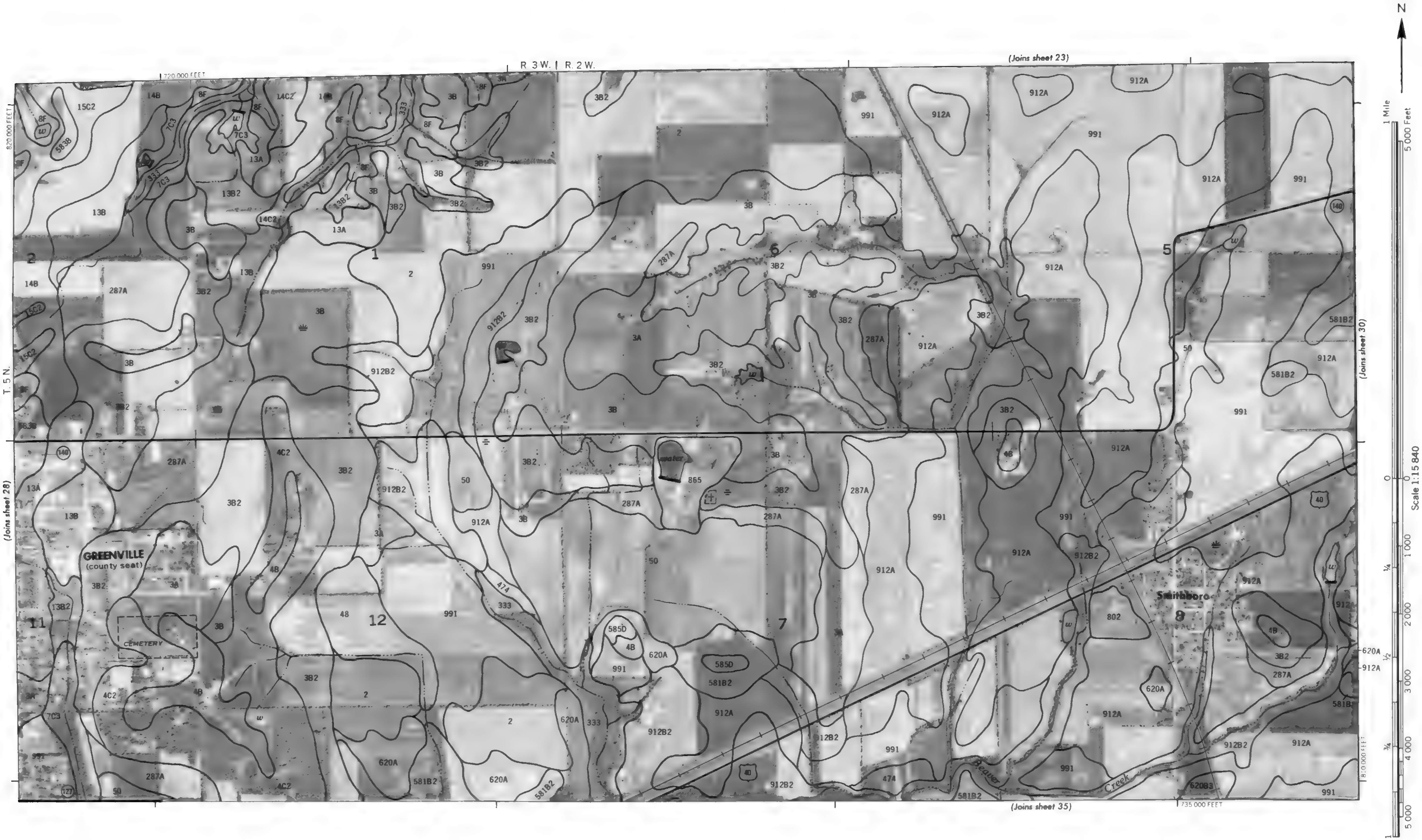

R. 5 W.
(Joins sheet 19)
655 000 FEET
820 000 FEET
T. 5 N.
MADISON COUNTY
(Joins sheet 26)
810 000 FEET
660 000 FEET
(Joins sheet 31)
Little Silver Creek
N
1 Mile
5 000 Feet
Scale 1:15 840

BOND COUNTY, ILLINOIS — SHEET NUMBER 26

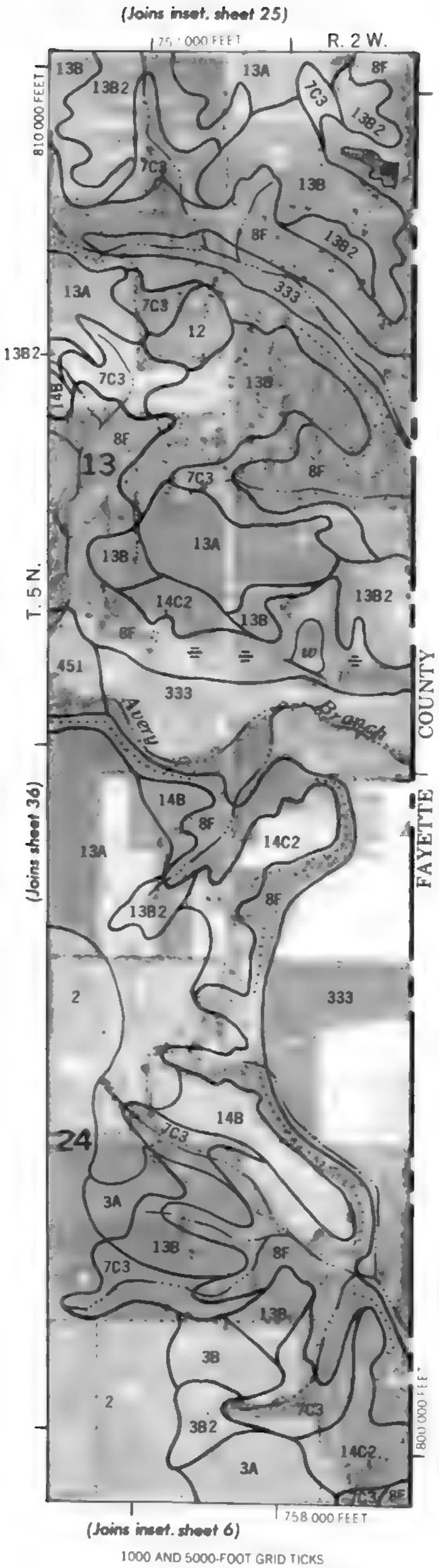
BOND COUNTY, ILLINOIS — SHEET NUMBER 27

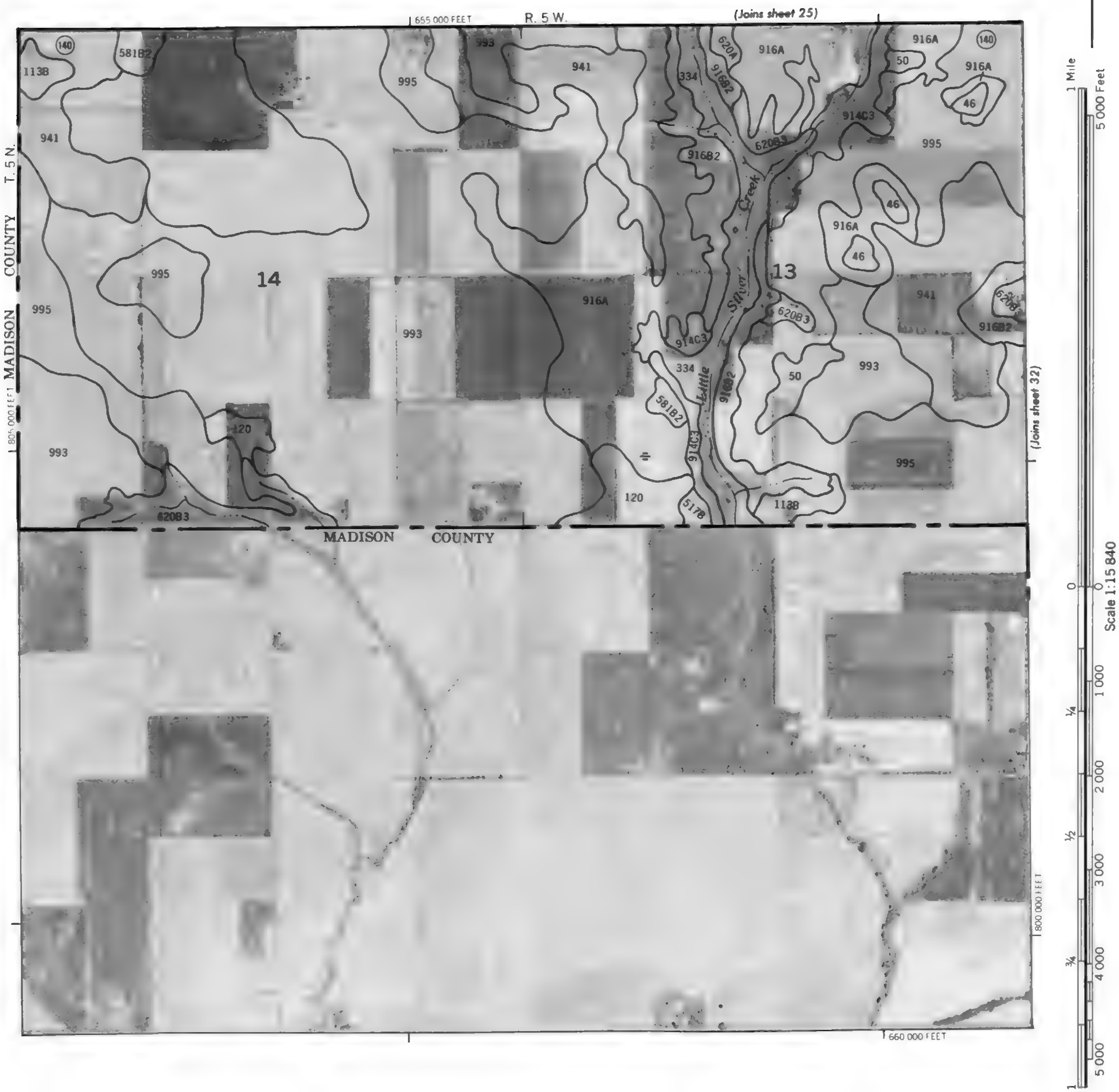


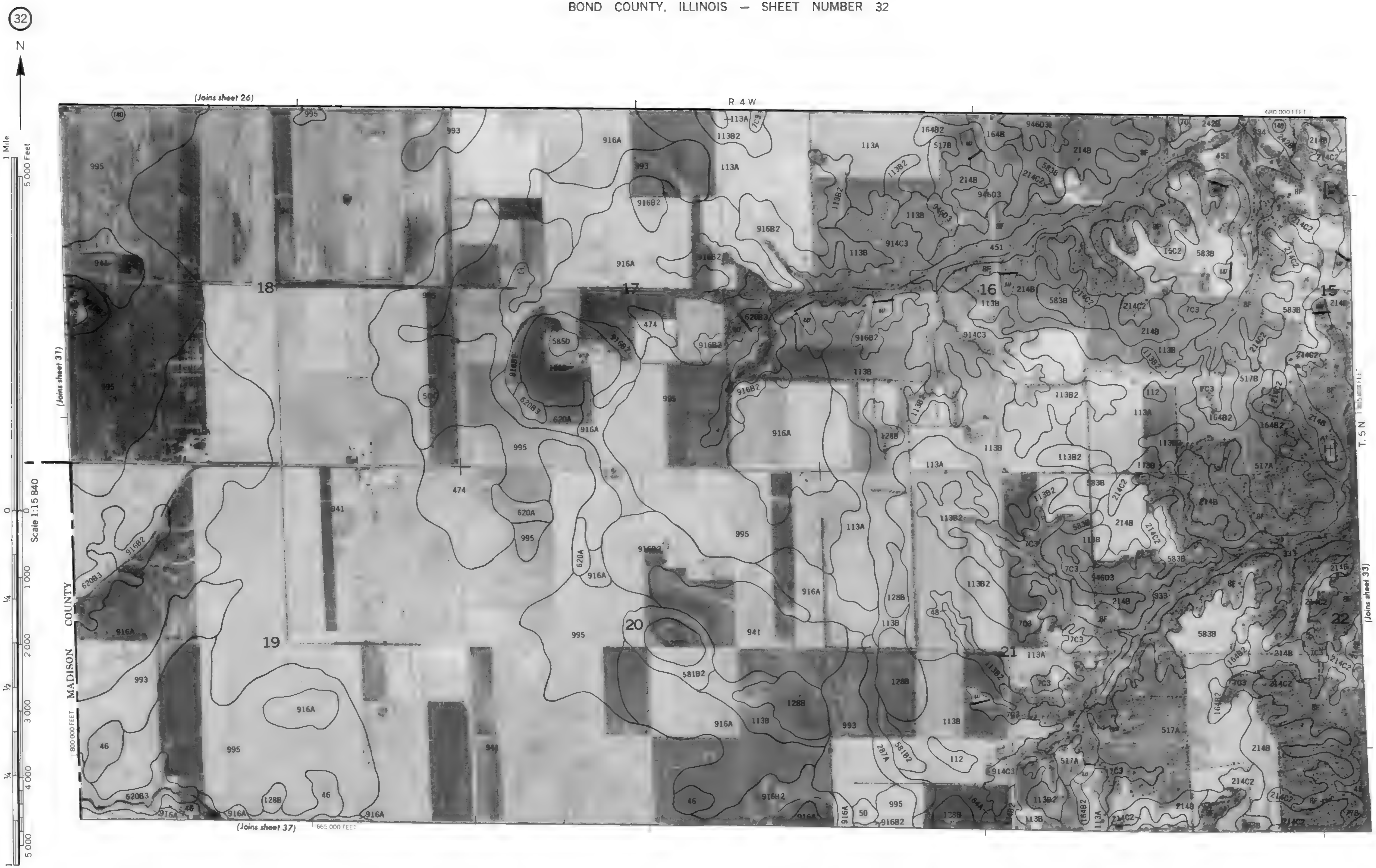

N
1 Mile
5 000 Feet
Scale 1:15 840
(Joins sheet 22)
R. 3 W.
715 000 FEET
820 000 FEET
(Joins sheet 27)
T. 5 N.
(Joins sheet 29)
810 000 FEET
700 000 FEET
(Joins sheet 34)
GREENVILLE PARK
Greenville Lake
SHOAL
BRANCH
EAST
CREEK
CEMETERY
SEWAGE LAGOON
GREENVILLE
(county seat)
127
140


N
R 3 W. | R. 2 W.
(Joins sheet 23)
(Joins sheet 28)
(Joins sheet 30)
(Joins sheet 35)
720 000 FEET
820 000 FEET
735 000 FEET
T. 5 N.
GREENVILLE
(county seat)
CEMETERY
Smithboro
Beaver
Creek
water
1 Mile
5 000 Feet
Scale 1:15 840
0
1 000
2 000
3 000
4 000
5 000
1/4
1/2
3/4
15C2
14B
8F
583B
7C3
333
13A
13B2
14C2
13B
3B
3B2
3A
2
287A
912B2
991
912A
6
5
50
581B2
4B
865
474
12
11
7
8
585D
620A
802
620B3
4C2
581B1


N
(Joins sheet 24)
R. 2 W.
(Joins sheet 29)
T. 5 N
(Joins inset, sheet 25)
(Joins sheet 36)
Royal Lake Resort
Beaver Creek
water
1 Mile
5 000 Feet
Scale 1:15 840
820 000 FEET
755 000 FEET

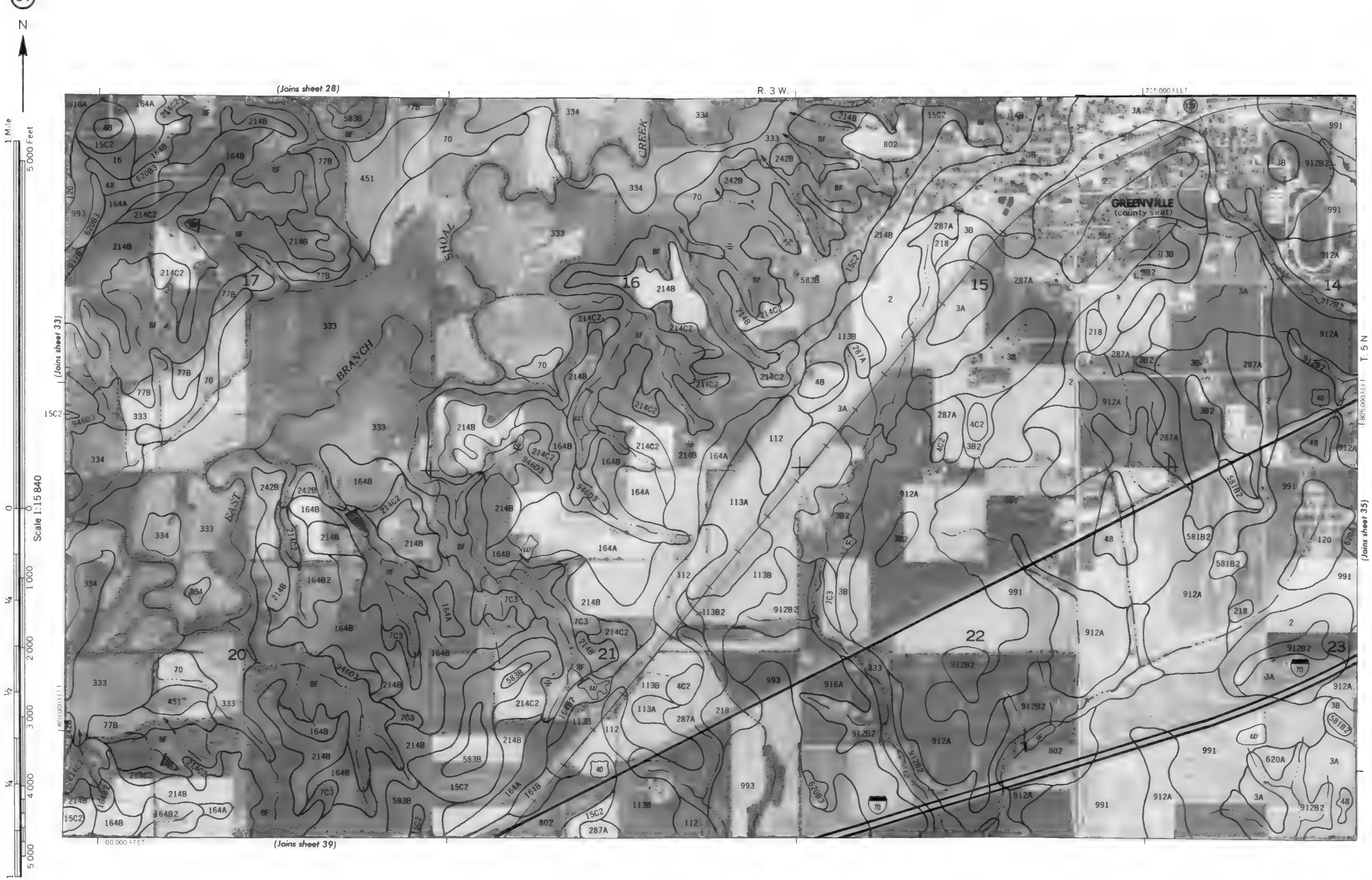

(Joins inset, sheet 25)
R. 2 W.
T. 5 N.
FAYETTE COUNTY
(Joins sheet 36)
Avery Branch
(Joins inset, sheet 6)
1000 AND 5000-FOOT GRID TICKS


R. 5 W.
(Joins sheet 25)
T. 5 N.
MADISON COUNTY
(Joins sheet 32)
Little Silver Creek
MADISON COUNTY
N
1 Mile
Scale 1:15 840
5 000 Feet

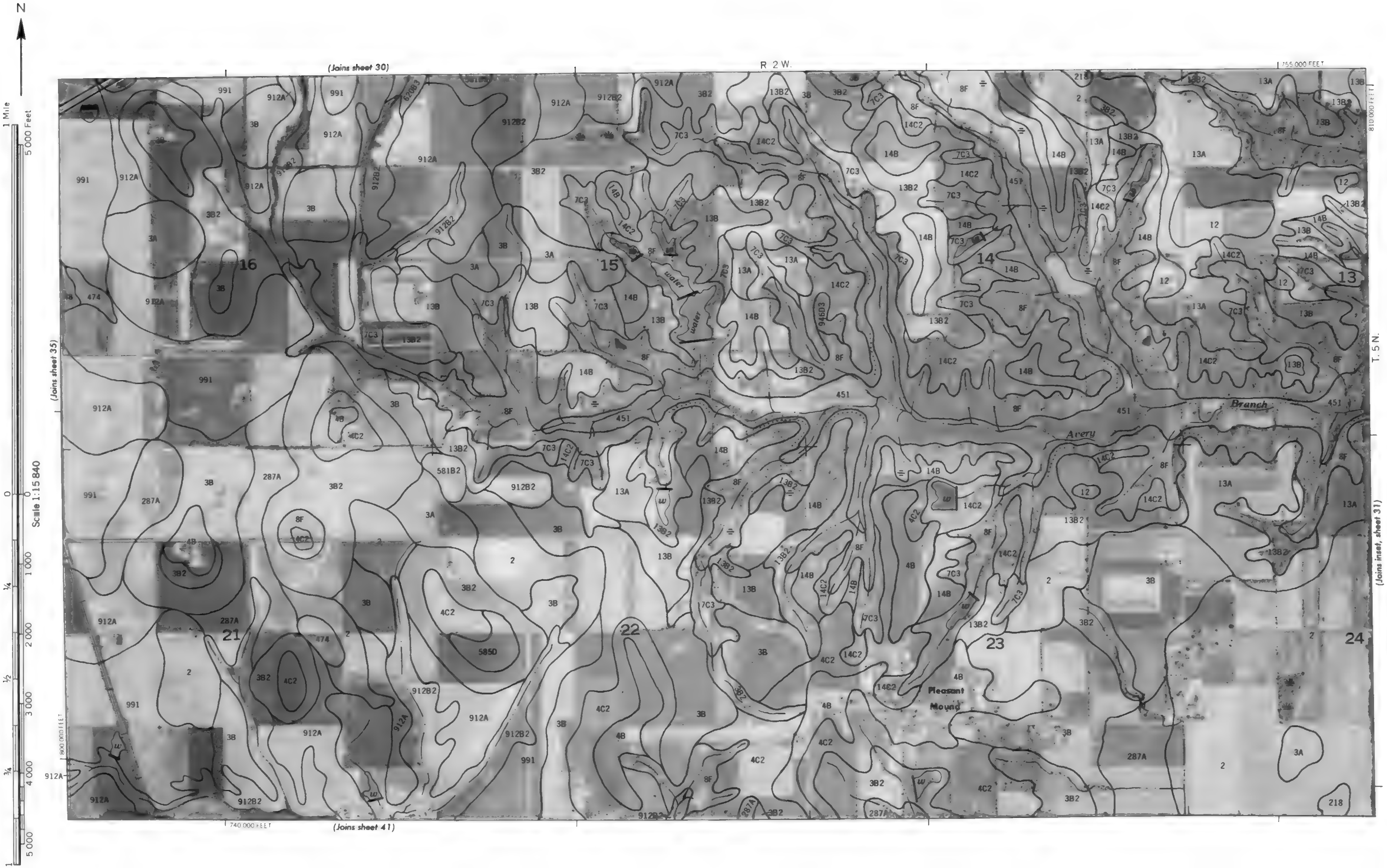

32
N
(Joins sheet 26)
R. 4 W
680 000 FEET
(Joins sheet 31)
(Joins sheet 33)
(Joins sheet 37)
665 000 FEET
800 000 FEET
T. 5 N.
MADISON COUNTY
18
17
16
15
19
20
21
22
Scale 1:15 840
1 Mile
5 000 Feet

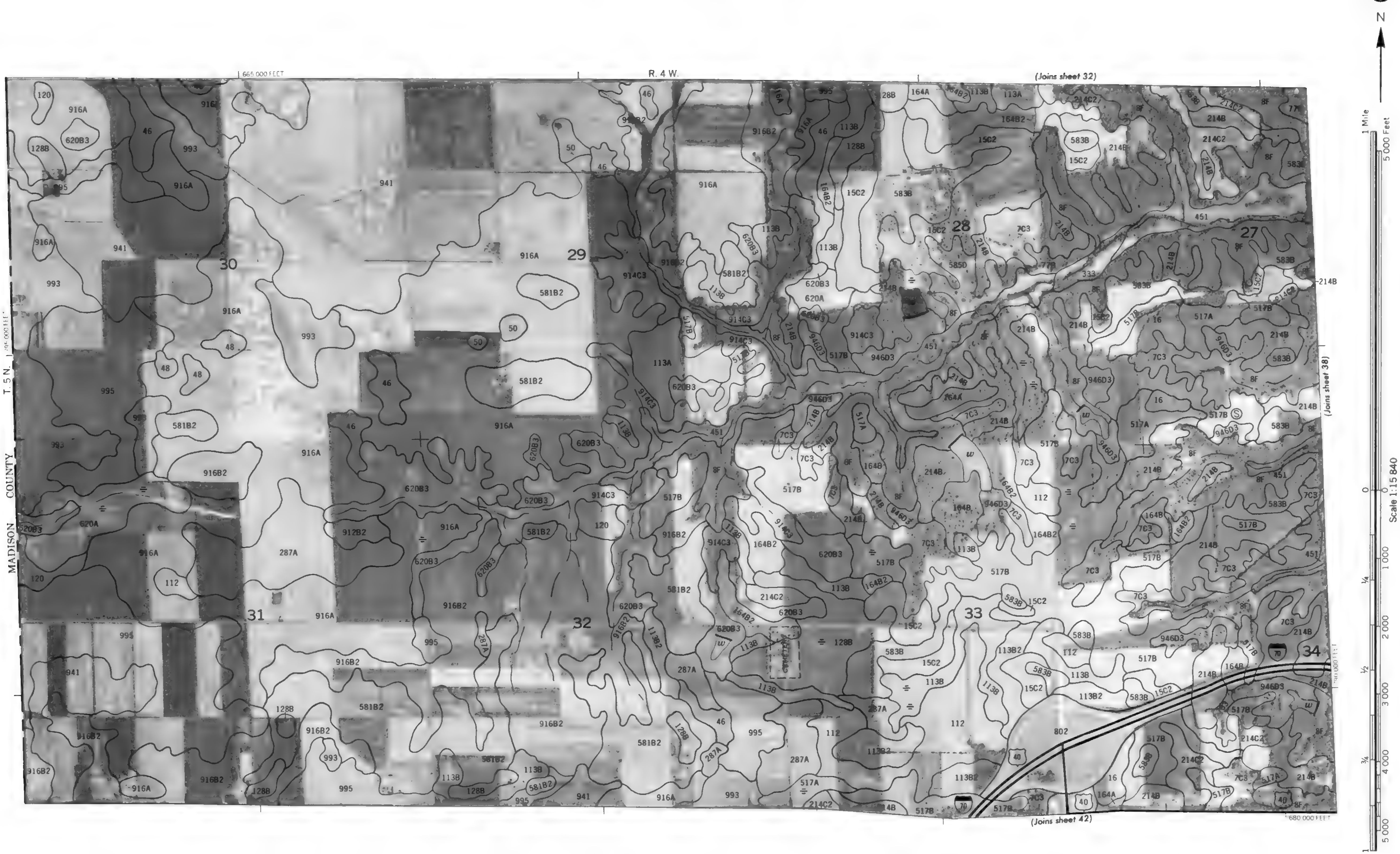

33
N
(Joins sheet 27)
(Joins sheet 32)
(Joins sheet 34)
(Joins sheet 38)
685 000 FEET
695 000 FEET
805 000 FEET
800 000 FEET
R. 4 W.
R. 3 W.
T. 5 N.
Indian Creek
SHOAL CREEK
EAST BRANCH
SHOAL CREEK
15
14
13
18
22
23
24
19
1 Mile
5 000 Feet
Scale 1:15 840

BOND COUNTY, ILLINOIS — SHEET NUMBER 34



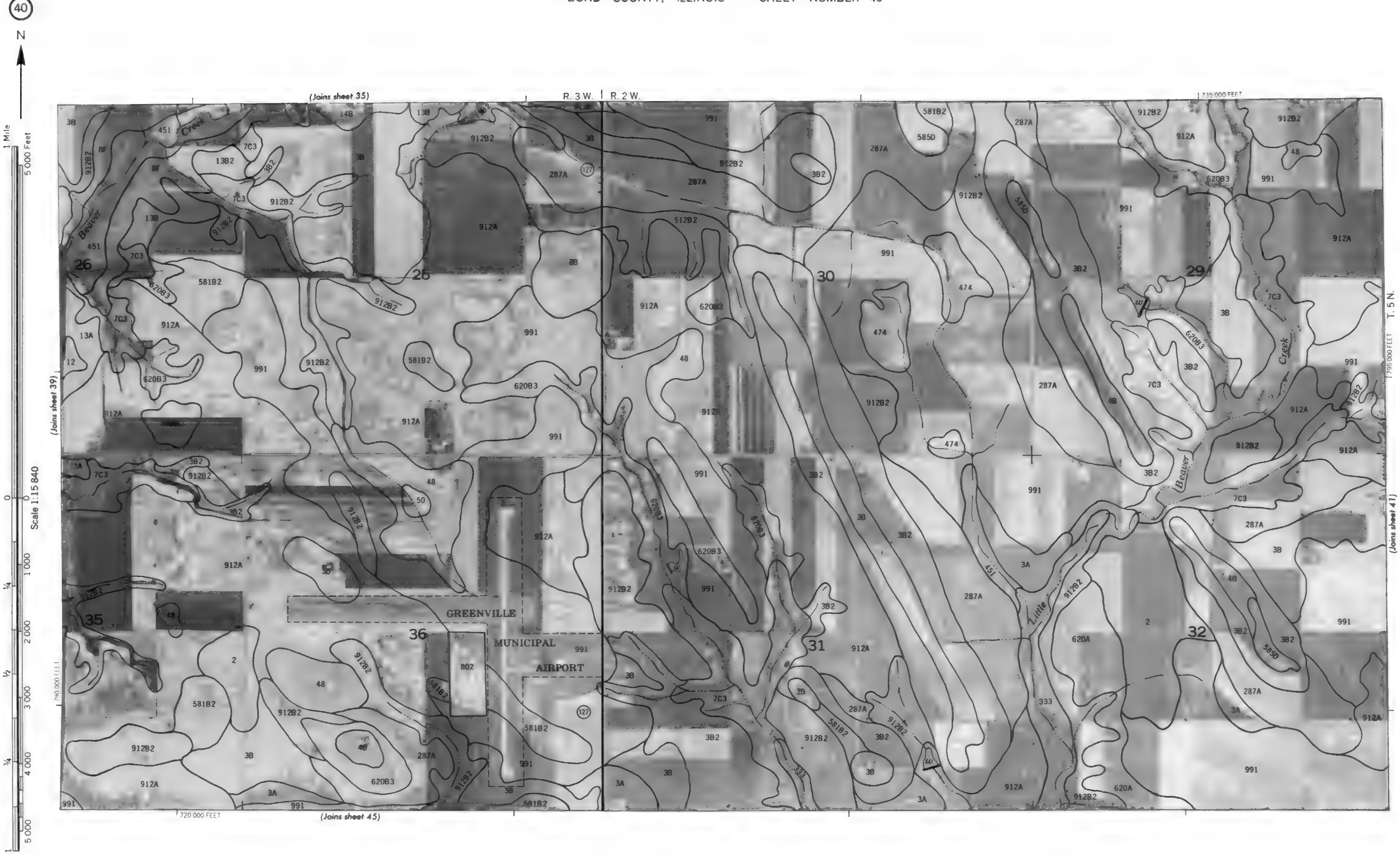

N
R. 3 W. | R. 2 W.
(Joins sheet 29)
(Joins sheet 34)
(Joins sheet 36)
(Joins sheet 40)
T. 5 N.
720 000 FEET
735 000 FEET
805 000 FEET
800 000 FEET
GREENVILLE
(county seat)
Beaver Creek
Little Beaver Creek
water
13
14
17
18
19
20
23
24
1 Mile
5 000 Feet
Scale 1:15 840

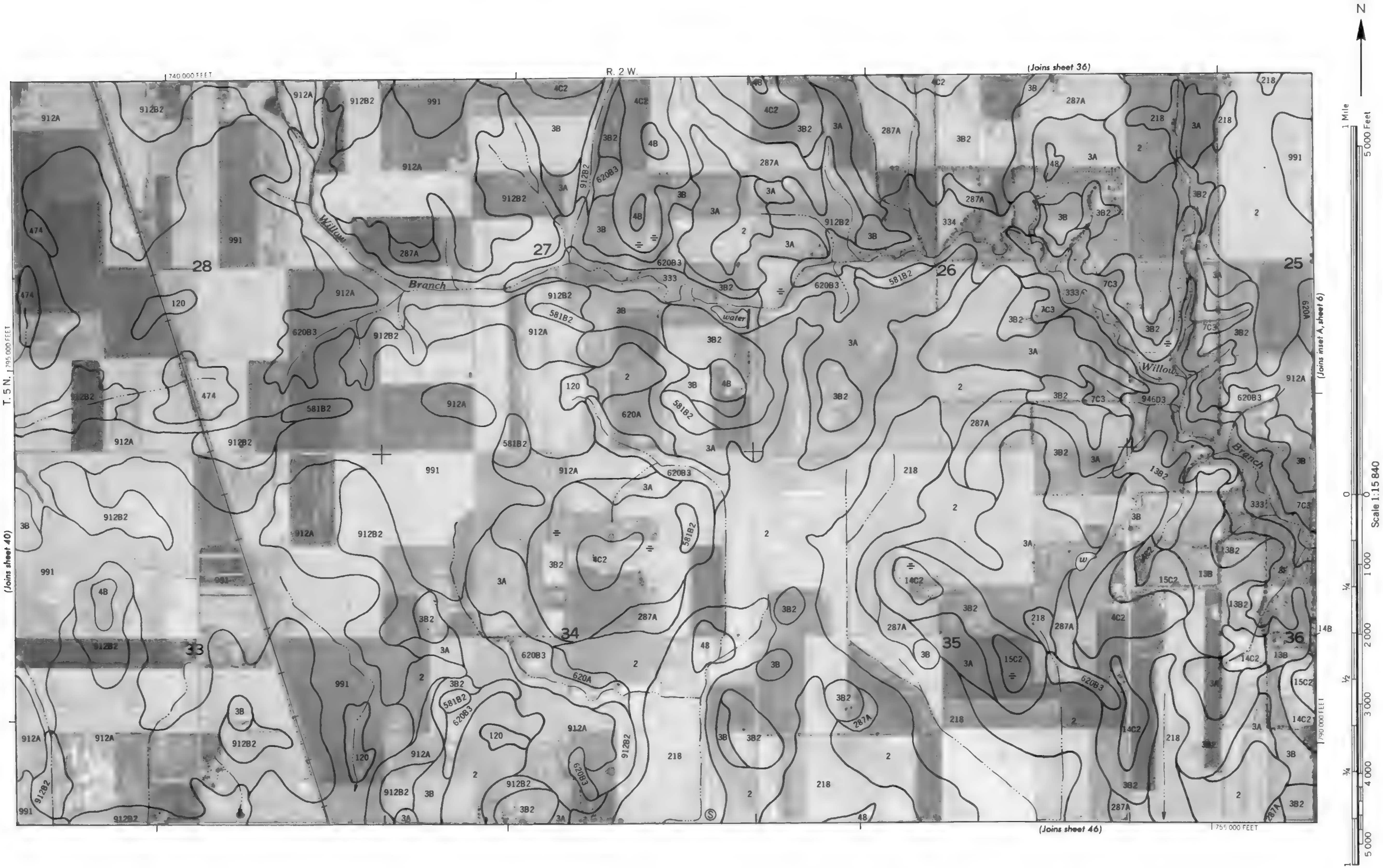

N
(Joins sheet 30)
R. 2 W.
755 000 FEET
810 000 FEET
(Joins sheet 35)
T. 5 N.
(Joins inset, sheet 31)
(Joins sheet 41)
740 000 FEET
800 000 FEET
1 Mile
5 000 Feet
Scale 1:15 840
16
15
14
13
21
22
23
24
water
Avery
Branch
Pleasant
Mound


R. 4 W.
665 000 FEET
(Joins sheet 32)
(Joins sheet 38)
(Joins sheet 42)
680 000 FEET
T. 5 N.
MADISON COUNTY
30
29
28
27
31
32
33
34
N
1 Mile
5 000 Feet
Scale 1:15 840
0
1/4
1/2
3/4
1 000
2 000
3 000
4 000
5 000
70
40

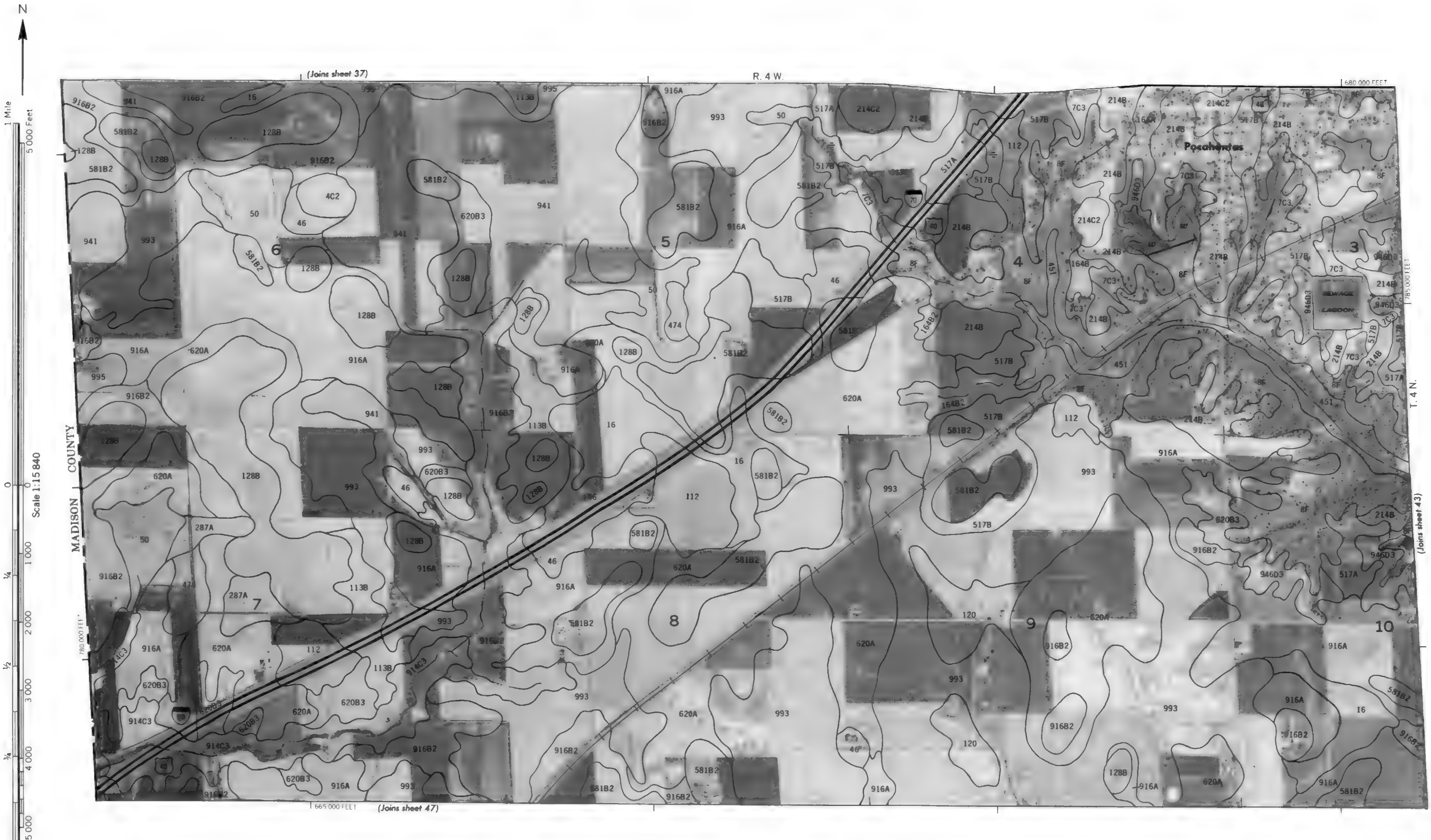

38
N
(Joins sheet 33)
(Joins sheet 37)
(Joins sheet 39)
(Joins sheet 43)
R. 4 W. | R. 3 W.
T. 5 N.
SHOAL CREEK
EAST SHOAL CREEK
SHOAL BRANCH
1 Mile
5 000 Feet
Scale 1:15 840
685 000 FEET
695 000 FEET


N
R. 3 W.
(Joins sheet 34)
(Joins sheet 38)
(Joins sheet 40)
(Joins sheet 44)
T. 5 N.
700 000 FEET
795 000 FEET
790 000 FEET
715 000 FEET
Stubblefield
Creek
Beaver
28
29
27
26
32
33
34
35
1 Mile
5 000 Feet
Scale 1:15 840


40
N
1 Mile
5 000 Feet
0
Scale 1:15 840
1 000
2 000
3 000
4 000
5 000
(Joins sheet 35)
R. 3 W.
R. 2 W.
735 000 FEET
T. 5 N.
795 000 FEET
(Joins sheet 39)
(Joins sheet 41)
790 000 FEET
720 000 FEET
(Joins sheet 45)
26
25
30
29
35
36
31
32
Beaver Creek
Creek
Beaver
Little
GREENVILLE
MUNICIPAL
AIRPORT
127

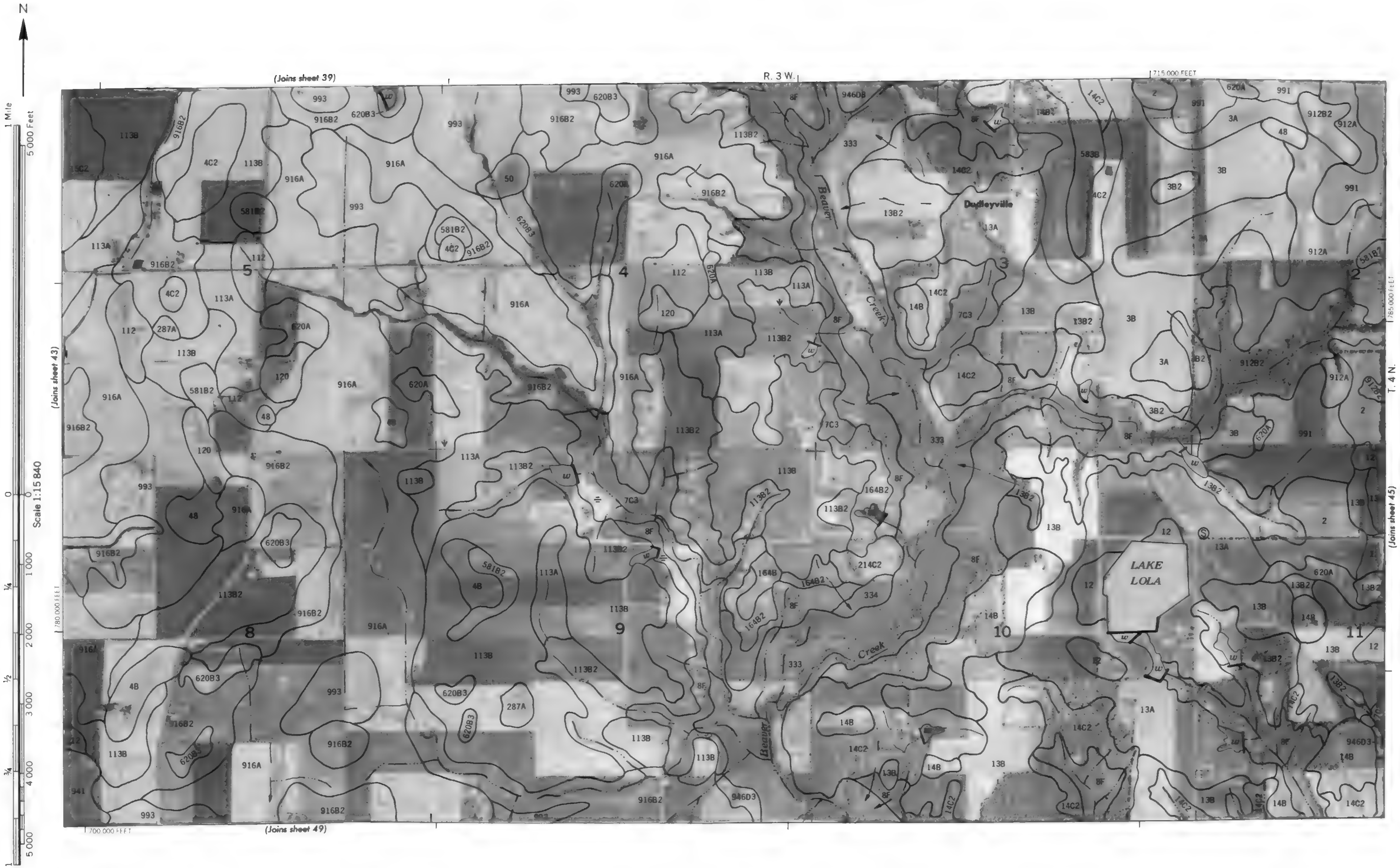

N
R. 2 W.
(Joins sheet 36)
740 000 FEET
T. 5 N.
795 000 FEET
(Joins sheet 40)
(Joins inset A, sheet 6)
(Joins sheet 46)
755 000 FEET
790 000 FEET
Willow Branch
Willow Branch
water
27
28
26
25
33
34
35
36
912A
912B2
991
4C2
3B
3B2
3A
4B
287A
218
2
474
120
620B3
581B2
620A
333
334
7C3
946D3
13B2
15C2
14C2
13B
14B
4C2
Scale 1:15 840
1 Mile
5 000 Feet
0
1 000
2 000
3 000
4 000
5 000
¼
½
¾

BOND COUNTY, ILLINOIS — SHEET NUMBER 42




N
R. 4 W. | R. 3 W.
(Joins sheet 38)
(Joins sheet 44)
(Joins sheet 48)
(Joins sheet 42)
T. 4 N.
685 000 FEET
695 000 FEET
SHOAL
CREEK
water
1 Mile
5 000 Feet
Scale 1:15 840

BOND COUNTY, ILLINOIS — SHEET NUMBER 44

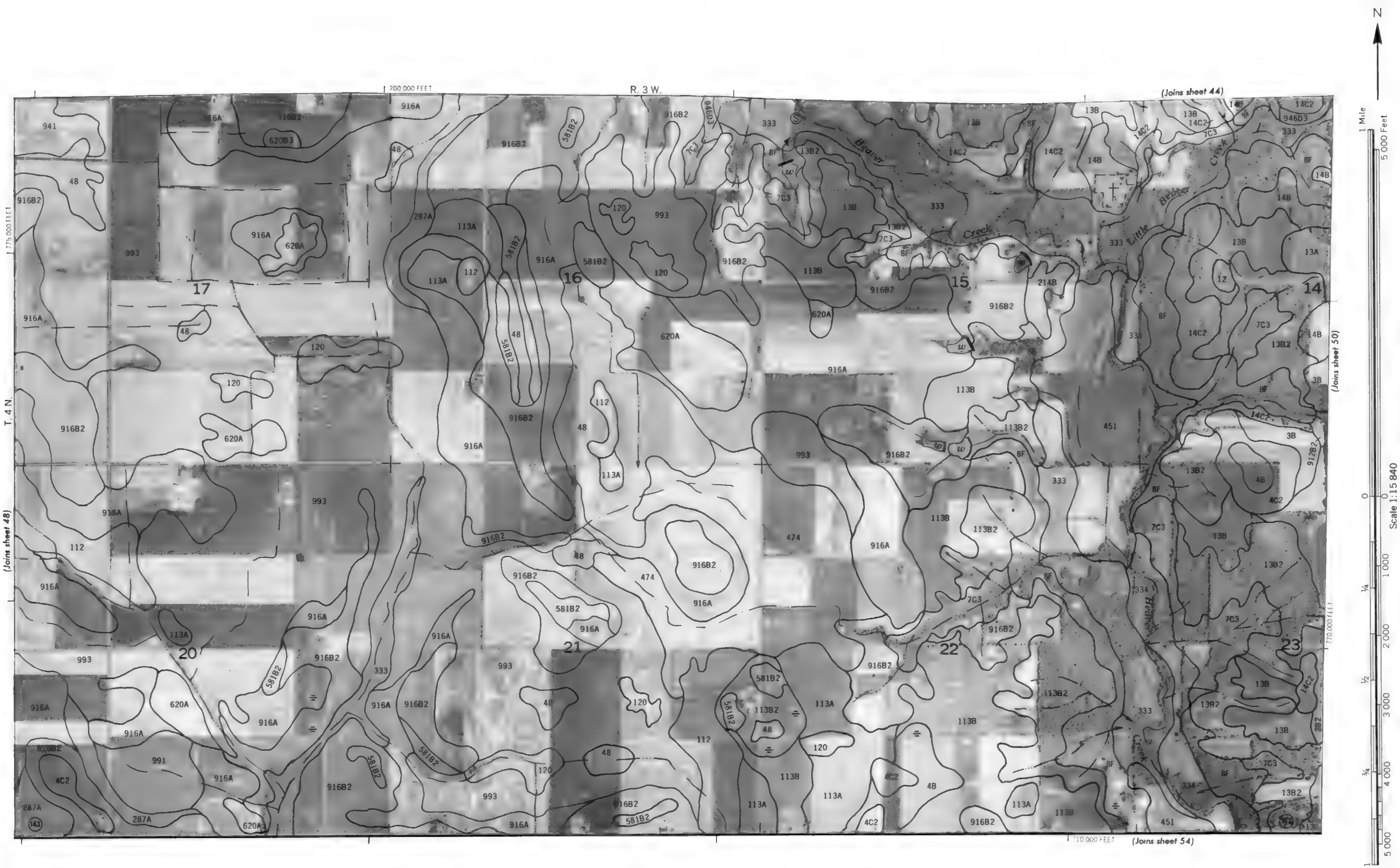



N
(Joins sheet 40)
(Joins sheet 46)
(Joins sheet 50)
(Joins sheet 44)
R. 3 W.
R. 2 W.
T. 4 N.
720 000 FEET
735 000 FEET
780 000 FEET
Little Beaver Creek
Flat Branch
1 Mile
5 000 Feet
Scale 1:15 840


N
1 Mile
5 000 Feet
Scale 1:15 840
(Joins sheet 41)
R. 2 W.
(Joins sheet 45)
T. 4 N.
(Joins inset 8, sheet 6)
(Joins sheet 51)
Spring Branch
Spring Branch
Stubblefield
740 000 FEET
785 000 FEET
333
4
3
2
1
9
10
11
12

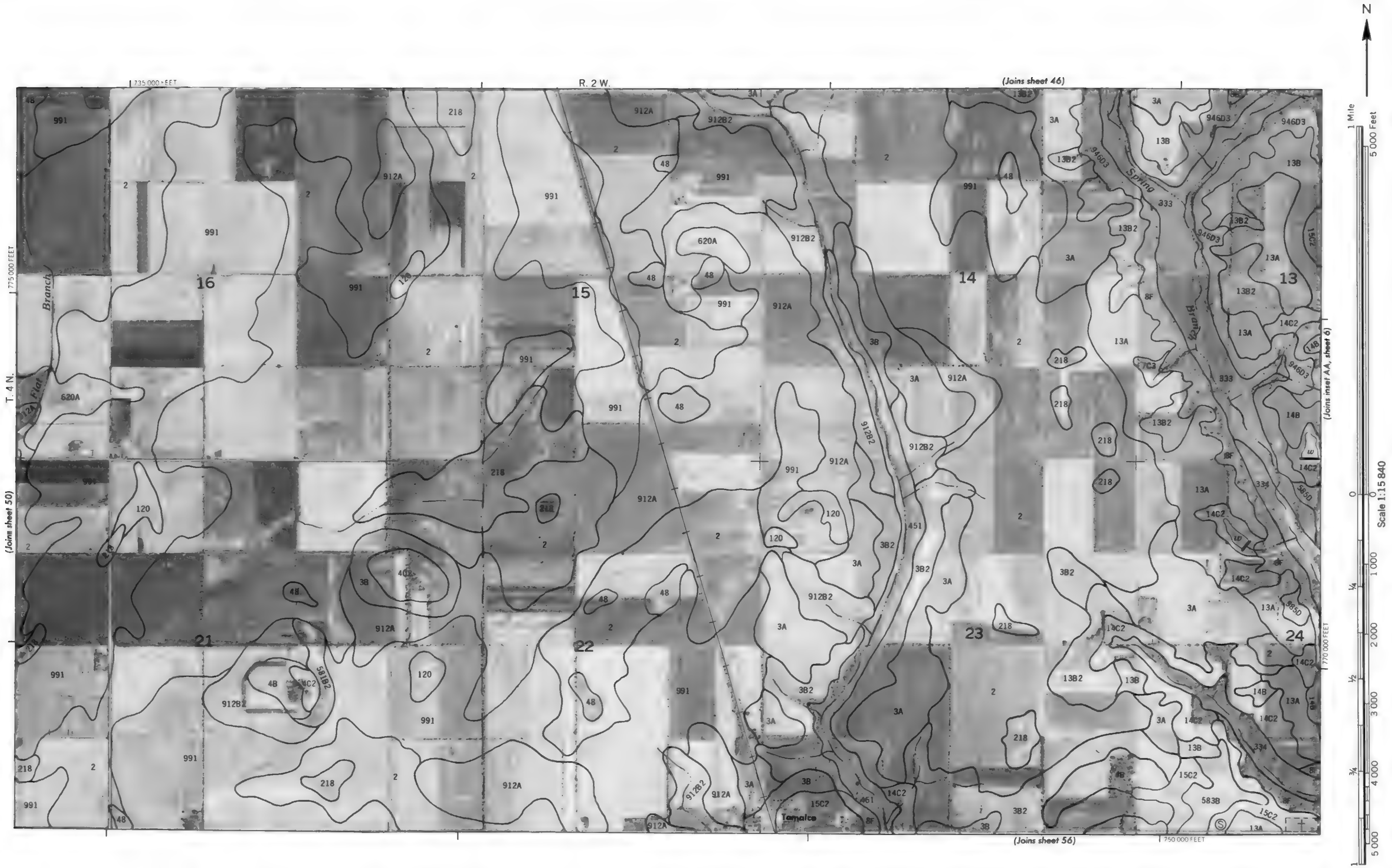

N
660 000 FEET
R. 4 W.
(Joins sheet 42)
(Joins sheet 48)
(Joins sheet 52)
675 000 FEET
775 000 FEET
770 000 FEET
T. 4 N.
MADISON COUNTY
Pierron
18
17
16
15
19
20
21
22
1 Mile
5 000 Feet
Scale 1:15 840

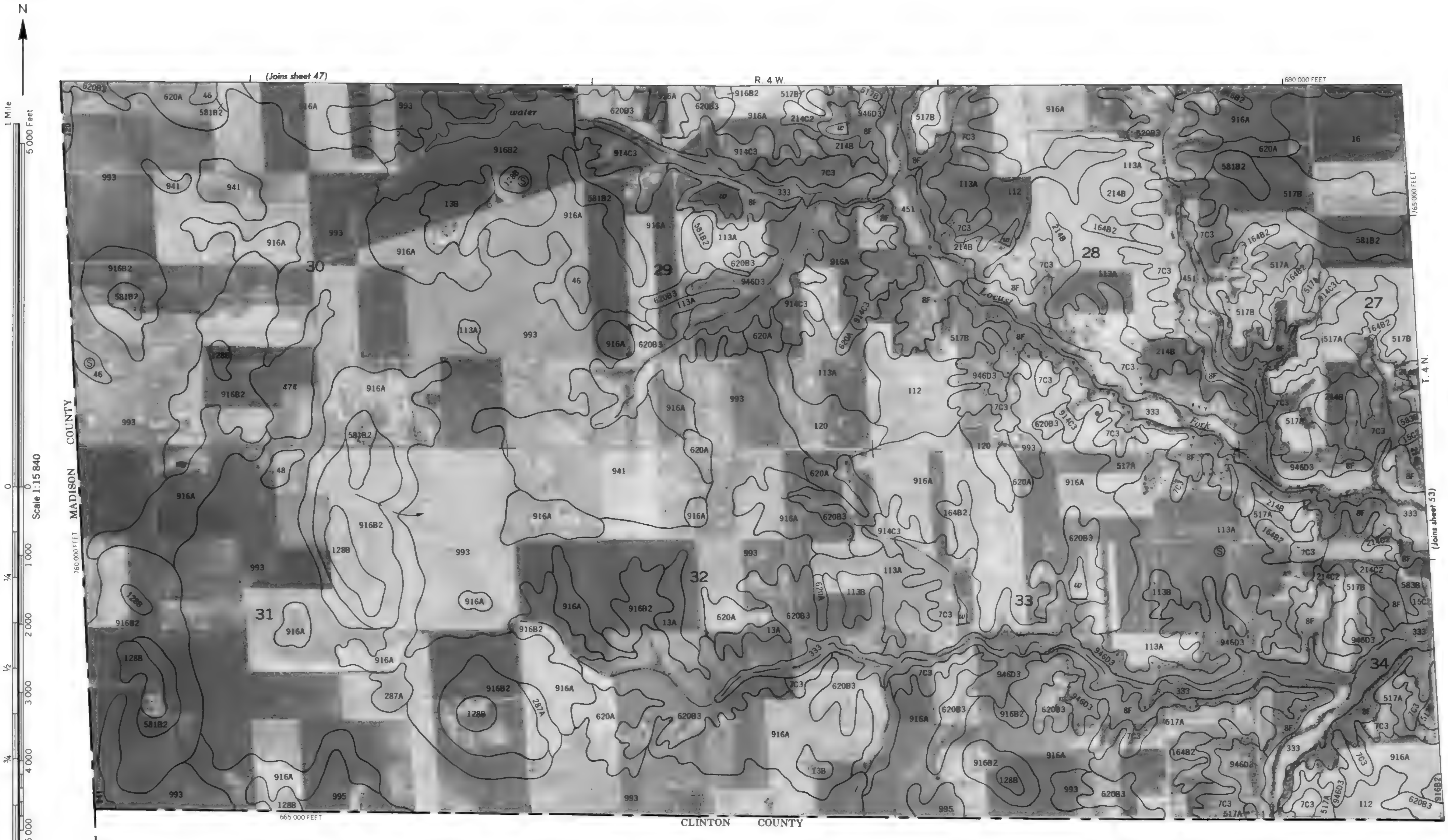

N
1 Mile
5 000 Feet
Scale 1:15 840
(Joins sheet 43)
(Joins sheet 47)
(Joins sheet 49)
(Joins sheet 53)
R. 4 W.
R. 3 W.
T. 4 N.
680 000 FEET
Baden Baden
SHOAL CREEK
14
13
18
15
22
23
24
19


N
R. 3 W.
700 000 FEET
(Joins sheet 44)
(Joins sheet 48)
(Joins sheet 50)
(Joins sheet 54)
T. 4 N.
775 000 FEET
770 000 FEET
710 000 FEET
Beaver Creek
Little Beaver Creek
17
16
15
14
20
21
22
23
1 Mile
5 000 Feet
Scale 1:15 840
0
1/4
1/2
3/4
1
1 000
2 000
3 000
4 000
5 000


N
1 Mile
5 000 Feet
Scale 1:15 840
(Joins sheet 45)
R. 3 W. | R. 2 W.
730 000 FEET
755 000 FEET
T. 4 N.
(Joins sheet 49)
(Joins sheet 51)
170 000 FEET
715 000 FEET
(Joins sheet 55)
14
13
18
17
23
24
19
20
Flat Branch
127
143

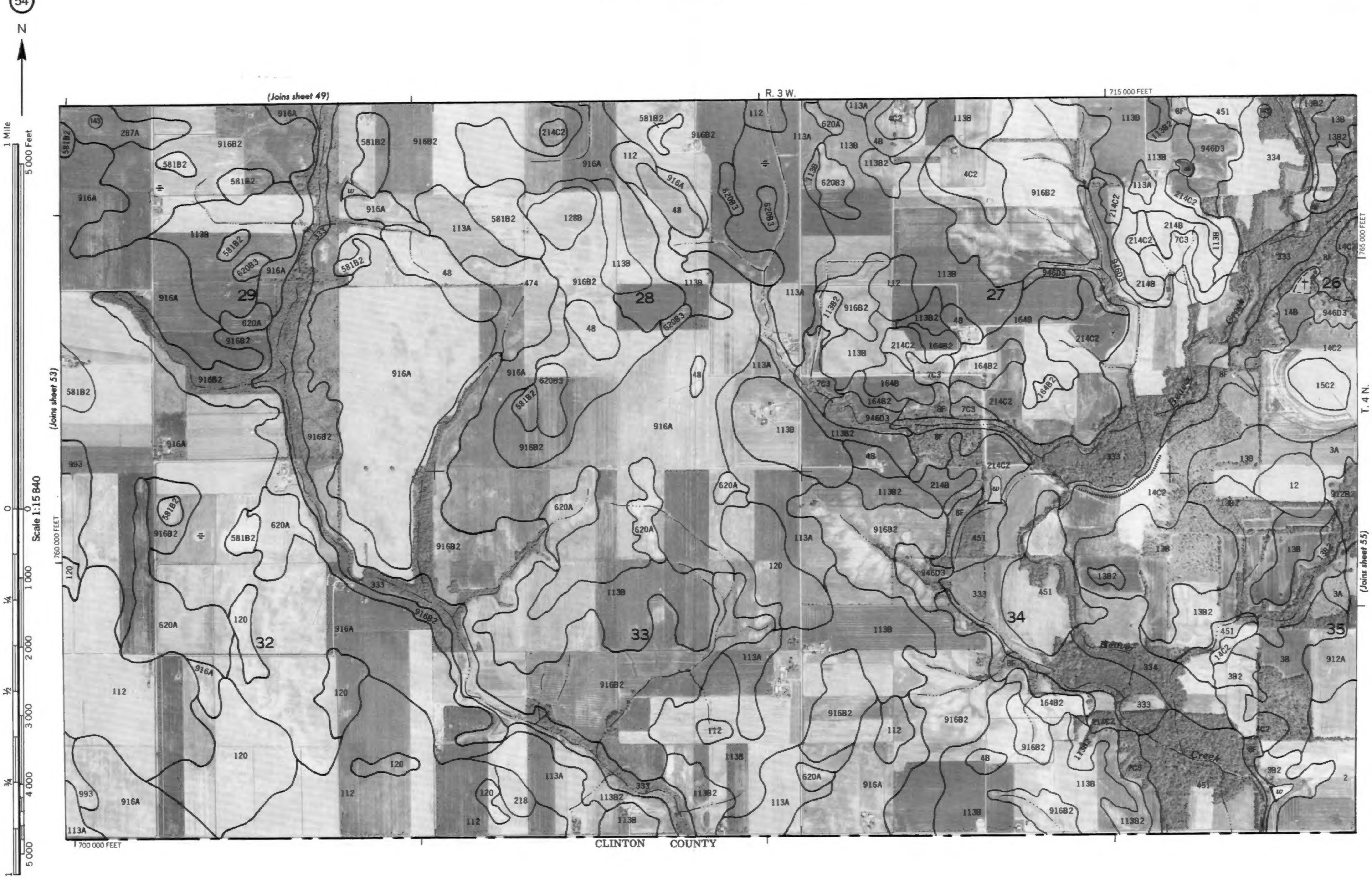
51



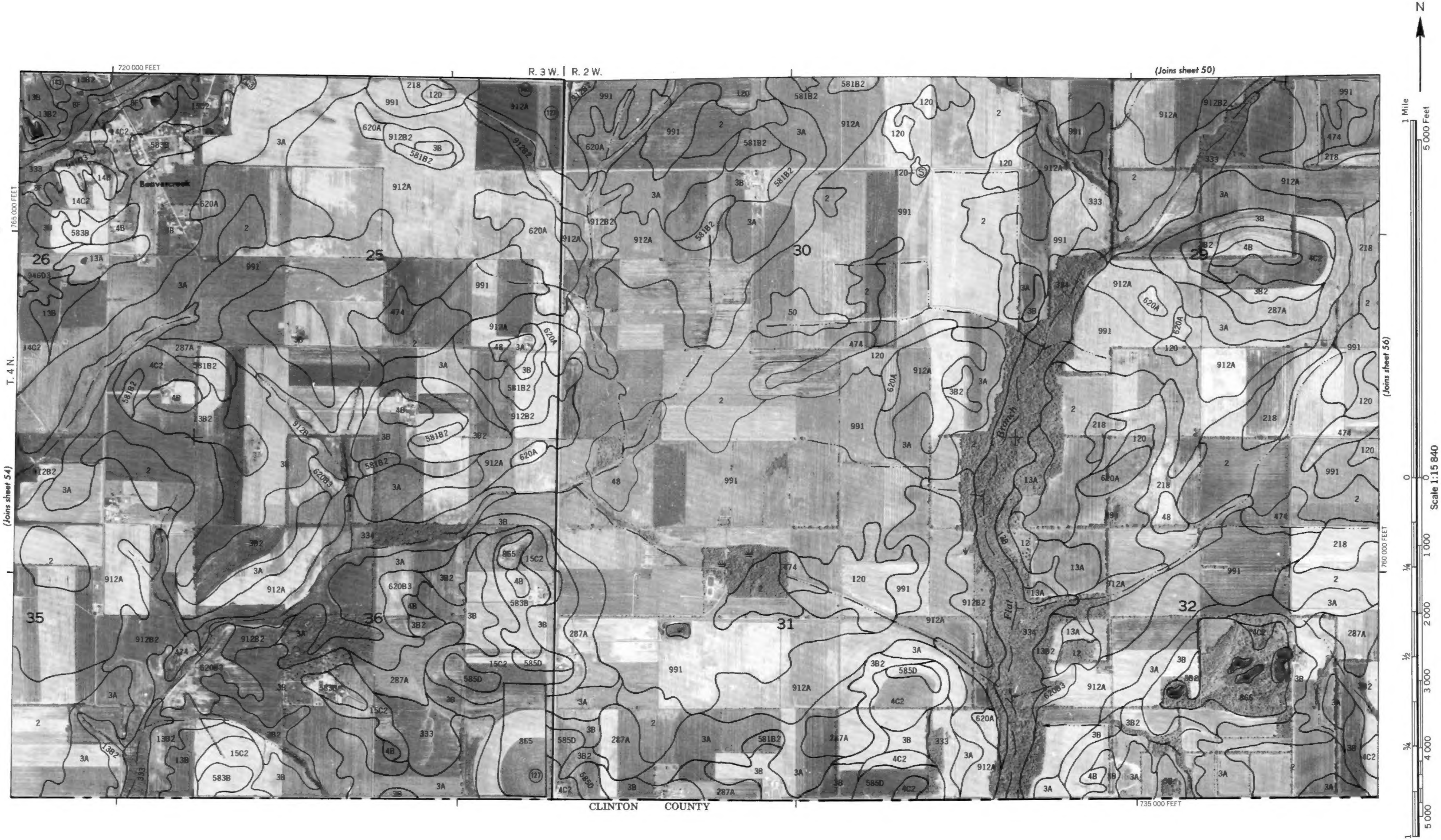

N
1 Mile
5 000 Feet
Scale 1:15 840
0
1 000
2 000
3 000
4 000
5 000
1/4
1/2
3/4
(Joins sheet 47)
R. 4 W.
680 000 FEET
765 000 FEET
T. 4 N.
(Joins sheet 53)
760 000 FEET
665 000 FEET
MADISON COUNTY
CLINTON COUNTY
water
Locust
Fork
27
28
29
30
31
32
33
34
620A
581B2
916A
993
916B2
914C3
620B3
214C2
946D3
517B
7C3
113A
941
13B
333
8F
451
112
214B
164B2
517A
46
120
128B
474
48
620A
287A
995
583B
15C2
214C2
113B

BOND COUNTY, ILLINOIS — SHEET NUMBER 53

53


54
N
1 Mile
5 000 Feet
Scale 1:15 840
0
1 000
2 000
3 000
4 000
5 000
¼
½
¾
(Joins sheet 49)
R. 3 W.
715 000 FEET
765 000 FEET
760 000 FEET
700 000 FEET
(Joins sheet 53)
(Joins sheet 55)
T. 4 N.
29
28
27
26
32
33
34
35
Beaver Creek
Creek
CLINTON COUNTY

BOND COUNTY, ILLINOIS — SHEET NUMBER 55



BOND COUNTY, ILLINOIS — SHEET NUMBER 56